RECOMMENDED 1986
FARE INCREASES
AND
ANALYSIS OF SHORT-RANGE
FARE INCREASE OPTIONS

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Fare Policies Task Force

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Chicago Transit Authority
Merchandise Mart Plaza, P.O. Box 3555
Chicago, Illinois 60654
(312) 664 7200

RECOMMENDED 1986
FARE INCREASES

Fare Policies Task Force
December, 1985

cta

Date: December 30, 1985

To: Chairman, Board Members

From: Larry Pianto, Chief Administrative Officer

Re: Recommended Fare Increases

Attached for your information is the recommendation of the Fare Policies Task Force for changes in the fare structure. The recommendation is for a $.10 rail differential with a $.25 transfer ($.15 reduced). The basic bus fare will remain at $.90 ($.40 reduced). The monthly pass price will be raised to $46.00 ($23.00 reduced).

Page 5 (Recommended Changes in Overall Fare Structure) provides a comparison of today's fare structure against the proposed fare increases.

An Ordinance is also attached for presentation to the Board, should they approve the staff's fare increase recommendations.

In the text of the staff recommendation is a brief summary of the public hearing comments. Detailed highlights and written comments are provided in the Board Secretary's office.

ERS:DNMB:df

Attachment

Fare Policies Task Force

D. Stuart, Chairman
B. Baxa
A. Curtis
H. Reddrick
G. Millonas
D. Perk
B. Baxa
H. Hirsch
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Board Members of:

PACE
Metra
RTA

Originated by:

Ernest R. Sawyer
Deputy Executive Director
Planning & Development

	Present CTA Fares		Recommended CTA Fares	
	Full	Reduced	Full	Reduced
Basic Fare				
Basic Bus Fare	$ .90	$ .40	$ .90	$ .40
Shuttle Bus Fare	$ .60	$ .40	$ .90	$ .40
Express Bus*	$ 1.10	$ .60	$ 1.10	$ .60
Skokie Local Bus	$ .60	$ .25	$ .90	$ .40
Evanston Local Bus	$ .60	$ .25	$ .90	$ .40
Basic Rail Fare	$ .90	$ .40	$ 1.00	$ .50
Evanston Express Rail*	$ 1.10	$ .60	$ 1.20	$ .70
Evanston Local Rail	$ .60	$ .25	$ 1.00	$ .50
Rail Differential	n/a	n/a	$ .10	$ .10
Sunday Transfer				
Supertransfer	$ 1.40	$ .70	$ 1.75	$ .85
Culture Bus	$ 2.00	$ 1.00	$ 2.50	$ 1.25
Culture Bus Fare with regular transfer or monthly pass	$ 1.00	$ .50	$ 1.35	$ .70
Exchange of Super Transfer for Culture Bus Super Transfer	$ .60	$ .30	$ .75	$ .40
Transfer Charge	$ .10	$ .10	$ .25	$ .15
Monthly Pass	$40.00	$18.00	$46.00	$23.00
Tokens				
Full/Reduced Tokens	$ .90 10/$8.50	$ .40 10/$4.00	$ .90 10/$8.50 (with $.10 rail differential when token presented)	$ .40 10/$4.00
Other				
Student ID Card	$ 5.00	replacement (	$ 5.00)	
P & R Lots	$ 1.00		$ 1.00	
Paratransit	$ .90		$ .90	
Transfer	$ .10		$ .25	

* $.20 surcharge collected one-way only.

Strategic Planning
December, 1985

PUBLIC HEARING SUMMARY

As directed by the CTA Board, the Fare Policies Task Force held eleven public hearings on three proposed fare increase options. A combination rail and transfer price increase option was also included in the public hearing package.

Ambivalence was the tone at all of the public hearings. A quick tally of comments from speakers at the public hearings show that the majority did not want a fare increase, stating that if CTA raised fares, they hoped CTA would also improve service. Once comments focused on the options, most speakers favored a rail increase or an across the board increase. Not many favored a transfer increase alone, stating that the new transfer regulations were enough for now. There were also a few comments on the combination rail and transfer increase option.

The overall responses from written and verbal comments at the hearings were:

Options:	
Increase transfer price	6 against
Rail fare increase only	11 for - 3 against
Across the board fare increase	9 for
Combination rail and transfer price increase	2 for - 4 against

Thirty-Seven (37) comments directly opposed any fare increase. Other comments were:

> CTA should investigate zone fare structure and peak/off-peak fare structure. The monthly pass should be discounted, and student and elderly riders should maintain all reduced fare riding benefits.

Highlights from all eleven hearings, along with some of the written comments turned in at the hearings, are attached. For more specific review, court reporter copies of the verbatim comments will be submitted to the Board Secretary.

FARE INCREASE RECOMMENDATION

After careful review of the public hearing comments and written statements, the Fare Policies Task Force proposes the following recommendations for changes in the fare structure:

	Full	Reduced
- Basic Bus Ride: (no change)	$ .90	$ .40
- the price of a transfer will increase:		
Transfer price	$ .25	$ .15
- the rail fare will increase:		
Basic Rail Fare	$1.00	$ .50
Differential Charge		
With Bus Transfer	$ .10	$ .10
With Token	$ .10	$ .10
Rail Transfer	No Differential Collected	

- the Central Area "shuttle bus", and the Evanston and Skokie local bus, will no longer have a special/local fare structure. The basic bus and rail price will be the same system-wide. Shuttle and local terminology can be eliminated:

	Full	Reduced
Shuttle Bus Fare	$ .90	$ .40
Evanston Local Bus	$ .90	$ .40
Skokie Local Bus	$ .90	$ .40
Evanston Local Rail	$1.00	$ .50

- One-Way Express Surcharge: (no change)	$ .20	$ .20

- Token use at rail turnstiles will be contingent on modifications to turnstiles being completed by implementation date. All token users will be required to deposit a $.10 rail differential when entering the rail system:

Tokens (no change)	$ .90 10 for $8.50	$ .40 10 for $4.00

- Monthly pass prices will increase.

Monthly Pass	$46.00	$23.00

- the Sunday Supertransfer and Culture Bus Fares will increase. Persons boarding the Culture Bus with a regular transfer, Super Transfer or monthly pass will deposit an additional fare:

Supertransfer	$ 1.75	$ .85
Culture Bus	$ 2.50	$ 1.25
Culture Bus Fare with Regular Transfer or Monthly Pass	$ 1.35	$ .70
Exchange of Supertransfer for Culture Bus Supertransfer	$ .75	$ .40

NOTE: Additional analyses of both the monthly pass and the Sunday Supertransfer will be completed by June, 1986. Other fare prepayment options (bi-weekly pass, multi-ride ticket) and Sunday discount options (free transfer, $.75 bus fare) will be further investigated.

- the fare for CTA Special Services riders will be the same as the adult basic bus fare:

Paratransit	$.90
Transfer	$.25
Rail Differential	$.10

- Park-n-ride Lot (no change): $1.00

- Student I.D. (no change): $5.00
- Replacement (no change): $5.00

RIDERSHIP/REVENUE IMPACT

- The estimated ridership loss for this fare structure is 2.0%. The estimated net annual revenue gain is projected at $24 Million.

December, 1985
Strategic Planning

19R

RECOMMENDED CHANGES IN OVERALL FARE STRUCTURE

	Full Fare			Reduced Fare		
	Existing	Proposed		Existing	Proposed	
Fare Category		Bus	Rail		Bus	Rail
Cash Fares						
Basic Fare (Single Trip)	$ .90	$ .90	$1.00	$ .40	$ .40	$ .50
Transfer	$ .10	$ .25*	$ .25	$ .10	$ .15*	$ .15
Prepayment Plans						
Monthly Passes	$40.00	$46.00	$46.00	$18.00	$23.00	$ 23.00
Tokens	10/$ 8.50	same	*	10/$ 4.00	same	*
Special Fares						
Express Service	$ 1.10**	same	$1.20**	$ .60**	same	$ .70**
Local Suburban	$ .60	$ .90	$1.00	$ .25	$ .40	$ .50
Downtown Shuttle Buses	$ .60	$ .90	--	$ .40	same	--
Supertransfer	$ 1.40	$ 1.75	$1.75	$ .70	$ 1.85	$ .85
Culture Bus	$ 2.00	$ 2.50	--	$ 1.00	$ 1.25	--

*For use on rail, a rail differential of $.10 would also be required.

** $.20 surcharge collected one-way only.

Strategic Planning
December, 1985

ORDINANCE NO.

AN ORDINANCE ADJUSTING THE RATES AND CHARGES FOR USE OF TRANSPORTATION FACILITIES AND SERVICES OF THE CHICAGO TRANSIT AUTHORITY

WHEREAS, the Chicago Transit Authority (CTA) has conducted a public hearing and determined that the fare rates of the CTA must be increased; now, therefore:

WHEREAS, on November 25, 1985, the Transit Board, by Ordinance numbered 85-142, approved a proposed 1986 budget that conformed with the 1986 budget marks approved by the Regional Transportation Authority (RTA); and

WHEREAS, due to the increased farebox recovery ratio mandated by the Regional Transportation Authority (RTA), the CTA included within its budget a farebox revenue increase of $22.6 Million Dollars needed to balance the budget; now therefore:

BE IT ORDAINED BY CHICAGO TRANSIT BOARD
OF CHICAGO TRANSIT AUTHORITY:

SECTION 1. The attached schedule, marked Attachment A, Proposed CTA Fares, is made a part of this Ordinance.

SECTION 2. All CTA ordinances, by-laws, rules and regulations not inconsistent with Section 1 of this ordinance shall remain in force and effect.

SECTION 3. That the Chairman of the Board is authorized to implement the attached schedule of proposed fares on Sunday, February 9, 1986.

SECTION 4. This Ordinance shall be in full force and effect from and after its passage.

APPROVED: PASSED:

Chairman

Secretary

Attachment "A"

Proposed CTA Fares

	Full	Reduced
Basic Fare		
Basic Bus Fare	$ .90	$ .40
Shuttle Bus Fare	$ .90	$ .40
Express Bus*	$1.10	$ .60
Skokie Local Bus	$ .90	$ .40
Evanston Local Bus	$ .90	$ .40
Basic Rail Fare	$1.00	$ .50
Evanston Express Rail*	$1.20	$ .70
Evanston Local Rail	$1.00	$ .50
Rail Differential	$ .10	$ .10
Sunday Transfer		
Supertransfer	$1.75	$ .85
Culture Bus	$2.50	$1.25
Culture Bus Fare with regular transfer or monthly pass	$1.35	$ .70
Exchange of Super Transfer for Culture Bus Super Transfer	$ .75	$ .40
Transfer Charge	$ .25	$ .15
Other		
Student ID Card	$5.00 replacement ($5.00)	
Full/Reduced Tokens	$.90 10/$8.50 (with $.10 rail differential when token presented)	$.40 10/$4.00
Monthly Pass	$46.00	$23.00
P & R Lots	$1.00	
Paratransit	$ .90	
Transfer	$ .25	

* $.20 surcharge collected one-way only.

Strategic Planning
December, 1985

cta

Date: December 24, 1985

To: Ernest R. Sawyer, Deputy Executive Director, Planning & Development

From: Darwin G. Stuart, Manager, Strategic Planning DGS

Re: Monthly Pass Pricing

A confusing set of targets, constaints, and options has emerged in our recent discussions of a monthly pass price (or prices) that would be appropriate for our recommended fare increase.

Targets

- No unexpected shortfall in net revenue gain, due to higher pass sales. Meaning: If we sell more passes to rail riders than expected (more than today's 20% of daily passengers), we might gain less than our $25 Million/Year increased farebox revenue target.

- No perception by today's regular pass customers that we are being unfair to them. A $48 monthly pass, one of the options we've discussed, would represent a 20% increase, while the average cash fare increase is only 10%. Bus-only passengers, particularly, might feel that a $48 pass puts them out of the pass market.

- No perception by rail pass users that we are causing unnecessary inconvenience. Most pass users (36%, according to a 1981 survey) feel that convenience is a major feature of the pass--they don't have to handle cash! A $45 pass, with a $.10 drop for each rail use, is likely to be poorly received by most rail riders. Why couldn't we figure out a pass price that would eliminate the need to carry dimes?

Constraints

- Coordination with proposed bi-weekly pass program. An increase in monthly pass price makes a less-expensive bi-weekly pass even more attractive.
    - Implementation of major changes in the CTA prepayment program ought to be achieved at the same time, to minimize disruption for both employees and passengers. However, implementation of a bi-weekly pass is not imminent.
    - A bi-weekly pass and separate rail and bus passes could mean 8 different passes (including reduced fare versions), where today we only have 2; this could be difficult for operating personnel.

Constraints (continued)

- Coordination with Pass Production and Distribution Schedule.
    - By a February 9, 1986 implementation date, it may not be possible to print two sets of passes (both bus and rail, with different prices); this is under investigation.
    - We may need a temporary, stopgap strategy for the months of February/March, with a single pass (with or without a rail drop for use on rail).
- Coordination with overall fare prepayment program.
    - Bi-weekly pass probably could not be implemented by February 9, but may be desirable.
    - 50-ride ticket or 20-ride ticket may also be desirable as prepayment options; these need further analysis.
    - It might be possible to have both a 20-ride ticket (for example) and a monthly pass, one aimed at less cash outlay and no-transfer trips, the other priced according to present monthly pass policy (aimed at transferring riders).
    - What is the role of tokens in such scheme?
    - What about "fare-cutter cards", a $15-$20 monthly pass that would allow riders to then board for a lower cash fare?
    - A 6-month study may be appropriate to sort out these prepayment options--including marketing needs and the potential for higher discounting--to come up with an overall plan for this portion of CTA fare policy.

Options

- 1980-81 Characteristics of Monthly Pass Users. Though dated, the results of 1980-81 mailback and interview surveys of monthly pass users provide useful background (see attachments).
    - On average, pass users make 57-70 person trips per month, and 102-103 transit vehicle trips (after accounting for transfers between transit vehicles).
    - On average, pass users transfer 1.5-1.8 times per person trip, while the system-wide transfer rate is about the same. (In other words, pass users do not appear to transfer much more than any other passengers.)

  - At an average fare (assuming 50% transfer purchase rate) of $.95, and 63 person trips per month, the net savings of a $40 monthly pass is $20, or 35%.
  - Clearly, the typical monthly pass user is making a substantial cash savings, and his pass purchase decision is tied to a high frequency of both work and non-work trip-making.
  - If possible, the statistical distribution of trip-making frequency should be further examined. In general, about 3/4 of all pass users are probably making at least 52 monthly person trips, saving about $10 (20%) over equivalent cash fares. This is the "hard core" pass purchase market, to whom a $10 savings would continue to be a general decision criterion.

- Single Pass, No Rail Drop. This has emerged as our leading option, at least for the next few months (it's implementable by February 9).
  - $44 Pass. Using average fare as a basis for setting the monthly pass price (since transferring behavior seems to be no different for pass users than for cash-fare riders), a single pass price of $44.50 (say $44) results.
  - Given the travel characteristics summarized above, the following monetary impacts are preliminarily estimated:

		Bus Only Riders (53%) Avg. Fare $1.05	Bus-Rail Riders (23%) Avg. Fare $1.14	Rail Only Riders (24%) Avg. Fare $1.00	All Pass Users Avg. Fare $1.06
Cash Savings to Pass User	52 trips/mo. $ savings % savings	$10 18%	$15 25%	$ 8 15%	$11 19%
	63 trips/mo. $ savings % savings	$22 33%	$28 39%	$19 30%	$22 34%

  - Note: Assumed in average fare calculations is that 60% of bus-only riders would purchase a transfer, 55% of bus-rail riders would purchase a transfer, and practically no rail-only riders would purchase a transfer.

- Conclusion: A $44 monthly pass would be about on target for bus-only riders, which probably represents about half of the pass-user market. However, for about a quarter of the pass-user market (bus-rail riders), a $44 pass would represent an increased discount, to about a $28 monthly savings (39%). Increased pass sales to this group, and a corresponding net decrease in expected farebox revenues, would be possible.

- $46 Pass. To overcome this problem with bus-rail pass-users, a $46 monthly pass would yield the following preliminary monetary impacts:

		Bus Only Riders (53%) Avg. Fare $1.05	Bus-Rail Riders (23%) Avg. Fare $1.14	Rail Only Riders (24%) Avg. Fare $1.00	All Pass Users Avg. Fare $1.06
Cash Savings to Pass User	52 trips/mo.				
	$ savings	$ 8	$13	$ 6	$ 9
	% savings	15%	22%	12%	16%
	63 trips/mo.				
	$ savings	$20	$26	$17	$21
	% savings	30%	36%	27%	31%

- Conclusion: Bus-Rail riders still receive an additional discount with a $46 pass, amounting to a 36% cost savings on average. However, bus-only riders would now face a slightly less attractive discount than at present, as would rail only riders (convenience has been found to be particularly attractive to the latter, however). An increase in pass sales to bus-rail riders would perhaps be offset by a corresponding decrease in pass-sales to bus-only and rail-only riders. Today's overall market penetration of 20% of daily passengers would have a good chance of being achieved.

- $48 Pass. Comparable estimates for a $48 pass are:

		Bus Only Riders (53%) Avg. Fare $1.05	Bus-Rail Riders (23%) Avg. Fare $1.14	Rail Only Riders (24%) Avg. Fare $1.00	All Pass Users Avg. Fare $1.06
Cash Savings to Pass User	52 trips/mo.				
	$ savings	$ 6	$11	$ 4	$ 7
	% savings	11%	18%	8%	13%
	63 trips/mo.				
	$ savings	$18	$24	$17	$19
	% savings	27%	33%	27%	28%

- Conclusion: a $48 pass would be on target only for bus-rail riders. For bus-only and rail-only riders, only a $17-$18 monthly average cash savings (compared to today's $20) would be achieved. This is still substantial, but some decrease in overall pass sales should be anticipated. A $48 pass would also represent a 20% increase in pass pricing, and would be negatively perceived by CTA's current regular pass users.

- Single Pass, $.10 Rail Drop. While the Fare Policies Task Force settled on this option, priced at $45, on 12/18/85, subsequent discussions have indicated the rail drop would be particularly undesirable. The above analysis suggests that a $45 pass, with no rail drop, might itself be workable.

- Need for 1986 Monthly Pass Surveys. To effectively monitor market impacts of the selected montly pass price, a before and after survey could be conducted. The 1980-81 survey forms could be reviewed and updated as needed. 1980-81 survey procedures could be assessed to determine if a new survey could be conducted in the 3rd or 4th week of January, 1986. An "after" survey could possibly then be conducted in May or June 1982. These surveys could also possibly probe attitudes toward bi-weekly passes and/or multiple ride tickets.

DGS:df

cc: H. Hirsch
J. Lawrie
D. Ryan
L. Ritter
D. Mitchell-Bey
N. Hall

Chicago Transit Authority
General Operations Division
Operations Planning Department
Routes/Systems

Monthly Pass Survey | OP-x81117
Results
March, 1981 | rev. 10-5-81

In March, 1981, a sample on-board interview survey was done of CTA's monthly pass riders. The interviews were done on 12 bus routes and at 11 rapid transit stations. These locations were randomly selected.

The interviews took place on-board buses and at rapid transit stations between 0600 and 1130 hours and 1300 and 1830 hours. When a person presented their monthly pass, the interviewer would ask the user if they could answer some questions relating to their monthly pass usage. There were an average of 27 responses per bus route and 43 responses per rapid transit station. There were more rail responses because the interviewers could move about more freely at rapid transit stations than on-board a crowded bus. Copies of both the March, 1981, interview survey and the February, 1980, mailback survey are attached.

The interviewer recorded the sex, race and the type of pass used by the respondent. The results were:

	Percentage
Sex	
male	38.1%
female	61.9%
Race	
white/other	54.0%
black	38.1%
hispanic	7.9%
Type of Monthly Pass	
CTA regular	96.5%
CTA reduced	3.1%
RTA	.4%

The first question the interviewer asked was if the pass user regularly purchased a monthly pass. The responses were:

Yes: 87.2% No: 12.8%

The interviewer then asked detailed information about each one-way trip and the number of vehicles boarded for each trip on the previous weekday, Saturday and Sunday.

- The following table illustrates the number of one-way trips* (linked trips) made on CTA with a monthly pass. It also shows what the responses were to this question in the February, 1980, mailback monthly pass survey.

Day	1981 Interview Survey One-way Trips (per passholder)	1980 Mailback Survey One-way Trips (per passholder)
Weekday	2.3	2.7
Saturday	1.1	1.6
Sunday	.6	1.2

* One-way trip is the start of one's journey to his final destination and could involve more than one bus or train.

- The interviewer asked what was the purpose for each of the one-way trips taken. The following table shows what the responses were to this question.

Purpose	Weekday	Saturday	Sunday
work	71.5%	24.7%	14.7%
shopping	6.9%	40.4%	13.4%
education	10.6%	4.0%	.8%
recreation	4.6%	16.3%	28.6%
medical	.9%	1.0%	0.0%
other	5.5%	13.6%	42.5%

- The number of CTA vehicles ridden (unlinked trips) or the number of times a monthly pass purchaser uses his monthly pass and the results of the 1980 mailback survey are shown below.

Day	1981 Interview Survey Vehicles Ridden	1980 Mailback Survey Vehicles Ridden
Weekday	4.2	3.9
Saturday	1.9	2.4
Sunday	1.0	1.8

- The mode split for the number of CTA vehicles ridden for both surveys were:

	1981 Interview Survey		1980 Mailback Survey	
Day	bus	rail	bus	rail
Weekday	59.6%	40.4%	66.0%	34.0%
Saturday	68.4%	31.6%	67.7%	32.3%
Sunday	73.7%	26.3%	71.7%	28.3%

The respondents were asked if they ride CTA more with a monthly pass than before they had purchased a pass. The following table shows what the responses were to this question in both surveys.

	1981 Interview Survey		1980 Mailback Survey	
Day	yes	no	yes	no
Weekday	55.3%	44.7%	67.5%	32.5%
Saturday	50.6%	49.4%	76.6%	23.4%
Sunday	55.6%	44.4%	69.1%	30.9%

The last question asked of the respondents was what was the reason or reasons they purchased a monthly pass. The results of both surveys are as illustrated below.

	1981 Interview Survey	1980 Mailback Survey
Cost savings	27.7%	5.1%
Convenience	36.4%	26.5%
Other	1.3%	3.2%
Cost savings/Convenience . . .	29.9%	65.2%
Cost savings/Other	2.2%	
Convenience/Other	.1%	
Cost savings/Convenience/Other	2.4%	

DHR/sj

Attachment

Chicago Transit Authority
General Operations Division
Operations Planning Department
Routes/Systems

Monthly Pass Survey	OP-y80088
Results January, 1980	4/10/80

In late January, 1980, a small sample survey was done of CTA's February monthly pass purchasers. The surveys were distributed at six CTA operating locations and at 17 participating companies. The six operating locations were the Merchandise Mart, Jefferson Park, 95th Street, Limits, 69th Street, Lawndale. These locations were selected based on their geographic locations and the number of passes sold during the previous two months. The participating companies were randomly selected.

Each operating location received 100 surveys which were passed out along with the February monthly pass. There were approximately 297 surveys passed out at 17 participating companies. Each participating company's pass administrator was called by a CTA representative and asked to pass out a survey to everyone who bought February passes; they returned any surveys not distributed.

RESULTS

- The following table shows the number of surveys that were distributed and returned.

Location	Distributed	Returned	Percent returned
CTA	600	293	48.8%
Companies	297	84	28.3
TOTAL	897	377	42.0%

- The survey asked the respondents if they ride, or will ride, CTA more with a monthly pass. The following tables show the response for both the people who had purchased a monthly pass in January (and whose answers reflect their experience with using a monthly pass), and those who had not purchased a pass in January (whose answers reflect how often they expect to use their monthly pass). Responses were quite similar.

Do you ride CTA more with a pass?	Purchased a monthly pass in January		No. of observations
	yes	no	
weekday	67.5%	32.5%	292
Saturday	76.6	23.4	265
Sunday	69.1	30.9	243

Will you ride CTA more with a pass?	Did not purchase a monthly pass in January		No. of observations
	yes	no	
weekday	67.3%	32.7%	52
Saturday	81.8	18.2	44
Sunday	77.3	22.7	44

- Data from questions #3 and #4 are shown below; it is limited to respondents who had purchased a January monthly pass, and whose answers to #3 and #4 were consistent.

  There were only 120 (38.6%) valid responses to questions #3 and #4. The low response rate indicates that many respondents were confused about these questions.

QUESTION #3: How many one-way ("linked") trips on CTA do you make on a typical day?

	0 trips	1 trip	2 trips	3 trips	4+ trips
weekday (rush hour)	10.8%	12.5%	69.2%	4.2%	3.3%
weekday (other)	47.5	23.3	23.3	1.8	4.1
Saturday	21.7	17.5	47.5	4.2	9.1
Sunday	41.6	14.2	36.7	.8	6.7

QUESTION #4: How many vehicles ("unlinked") do you ride on a typical day?

	0 buses	1 bus	2 buses	3 buses	4+ buses
weekday	4.2%	9.2%	51.7%	10.0%	24.9%
Saturday	26.7	10.0	47.5	5.8	10.0
Sunday	43.3	8.3	35.8	3.4	9.2

	0 L-subway	1 L-subway	2 L-subway	3 L-subway	4+ L-subway
weekday	33.3%	20.0%	37.5%	1.7%	7.5%
Saturday	56.7	15.8	23.3	.9	3.3
Sunday	70.0	12.5	15.9	.8	.8

From question #3 we have determined the following linked trip volumes:

		linked trips		
	riders	total	per rider	per pass-holder (N = 120)
weekday/rush	107	213	2.0	1.8
weekday/ non-rush	63	114	1.8	1.0
WEEKDAY TOTAL	120	327	2.7*	2.7
5 weekdays	120	1,635	13.6	13.6
Saturday	94	196	2.1	1.6
Sunday	70	140	2.0	1.2
WEEK TOTAL	120	1,971	16.4*	16.4

*column doesn't add up due to different volumes of passengers each day

From question #4 we have determined the following unlinked trip volumes:

		unlinked trips						
		total				per pass holder (N = 120)		
	riders	bus	rail	total	per rider	bus	rail	total
weekday	120	306	158	464	3.9	2.6	1.3	3.9
5 weekdays	120	1,530	790	2,320	19.3	12.7	6.6	19.3
Saturday	94	197	94	291	3.1	1.6	.8	2.4
Sunday	70	152	60	212	3.0	1.3	.5	1.8
WEEK TOTAL	120	1,879	944	2,823	23.5*	15.6	7.9	23.5

*column doesn't add up due to different volumes of passengers each day

Combining this data indicates the following unlinked trips per linked trip averages, by day: weekday, 1.4; Saturday, 1.5; Sunday, 1.5; overall, 1.4.

- The mode split for the total number of CTA vehicles riden on a typical day for respondents who purchased a pass in January: weekday, 66.0% bus and 34.0% L-subway; Saturday, 67.7% bus and 32.3% L-subway; Sunday, 71.7% bus and 28.3% L-subway. Overall, this is 66.6% bus and 33.4% L-subway.

- 65.2% of the respondents buy a monthly pass for both cost savings and convenience; 26.5% buy it for convenience, 5.1% buy it for cost savings; and 3.2% buy it for other reasons.

Comments were made on about 50% of the returned monthly pass surveys. The majority of the comments were from people who express that they really like the monthly pass and think it is a great idea, especially for the convenience of not having to have the correct change. Some people recommend that there be more convenient sale locations. Several of the survey respondents asked if CTA could have plastic monthly passes or supply plastic holders.

MONTHLY PASS COUNT

A monthly pass count was done for the Finance Division by all CTA fare-collecting employees. For seven consecutive days in February, fare-collecting employees punched special count cards every time a monthly pass was presented to them. The number of unlinked trips per pass, per day in both the monthly pass count and survey were very similar. A comparison of these results is shown in the following table.

	Unlinked trips per pass-holder	
	monthly pass count	monthly pass survey
weekday	4.0	3.9
Saturday	2.3	2.4
Sunday	1.4	1.8

Both the monthly pass count and survey indicated that approximately 100 rides are taken per month with a monthly pass.

In the future, CTA monthly pass counts will be done quarterly.

DHR/sj

November 21, 1985

PROPOSED FARE INCREASES

The CTA Board is considering several options for increasing bus and/or rail transit fares. A summary of each option and its revenue implications are given in this report.

BACKGROUND

The Regional Transportation Authority, the financial oversight agency for all public transit operations in the Chicago area, requires that a certain proportion of annual operating expenses be derived from system-generated revenues. Nearly all such revenues are provided by passengers paying fares. Each year the RTA sets the required revenue/cost proportion (farebox recovery ratio) at around 50% for CTA.

In order to keep up with inflation (see graph), it will be necessary for CTA to consider fare increases from time to time, so that the required revenue/cost ratio can continue to be met. (The other 50 percent of costs, by the way, is met from federal, state, and local subsidies. The required ratio is designed to limit growth in these subsidies.) Though CTA has worked hard to control costs since its last fare increase in 1981, the 1986 Operating Budget indicates that a fare increase of about 10 percent will be necessary. This compares with an increase in the consumer price index (inflation) for Chicago of 20 percent over that 1981-1985 time period.

The alternative to increasing fares, while still maintaining the required revenue/cost ratio, would be to cut bus and rail service to reduce costs. Because major service cuts of this nature were already made in 1981, with serious negative impacts on those who depend on CTA service for their travel needs, it is considered highly desirable to maintain and even improve today's bus and rail operations. Doubling the frequency of maintenance inspections and a $5 Million bus security program are, for example, among the service improvements in the 1986 budget.

With a relatively modest fare increase of about 10 percent, CTA hopes to gain the needed revenue to meet expenses yet avoid the significant loss in ridership that was experienced in 1981. Both the 50% fare increase, from a base fare of $.60 to $.90, as well as major service cutbacks, led to a decline in bus ridership of 17 percent and a decline in rail ridership of 3 percent. The overall ridership decline of 14 percent was a major indication that such drastic fare increases--though they too were intended only to recover from the double-digit inflation being experienced at that time--should be avoided. It is CTA's desire to continue to serve and retain all of its present passengers, but the realities of inflationary cost increases must be dealt with in order to maintain quality service.

PROPOSED OPTIONS

Three different fare increase options are being considered carefully by the CTA Board. Each has its own pluses and minuses. These options are:

- Increase the price of transfers
- Increase rail fares over bus fares
- Increase both bus and rail fares

The pros and cons of these fare increase options are:

Increase the price of transfers:

Pro: Price hasn't increased since 1970
175% inflation since then
Present $.10 price a big bargain compared to other regions

Con: We're already tightening transfer usage regulations

Increase rail fares over bus fares:

Pro: Rail provides faster service
Average rail trip more than twice as long
Rail riders are less price sensitive

Con: Fare differential may cause some passenger inconvenience

Increase both bus and rail fares:

Pro: Easiest to implement and understand
Treats all passengers equally

Con: Could lose twice as much (or more) ridership as other options
Bus riders are more sensitive to fare increases than rail riders and will be more negatively impacted.

FARE STRUCTURE AND RIDERSHIP IMPACTS

The table below summarizes the fare structure and ridership changes associated with representative fare increase options of these types which the CTA Board is considering. Each option is designed to generate about $25 Million in additional annual revenue. A fourth option is included which represents a combination of increasing both the transfer price and rail fares.

Monthly pass prices would also be increased, in the same proportion as the average fare increase. Where the rail fare is increased over the bus fare, separate bus and rail monthly passes are proposed, with the rail pass priced proportionately higher. It is also proposed that local suburban fares be increased from $.60 to $.90 (with corresponding reduced fares increased from $.25 to $.40), and that downtown shuttle bus fares be increased from $.60 to $.90.

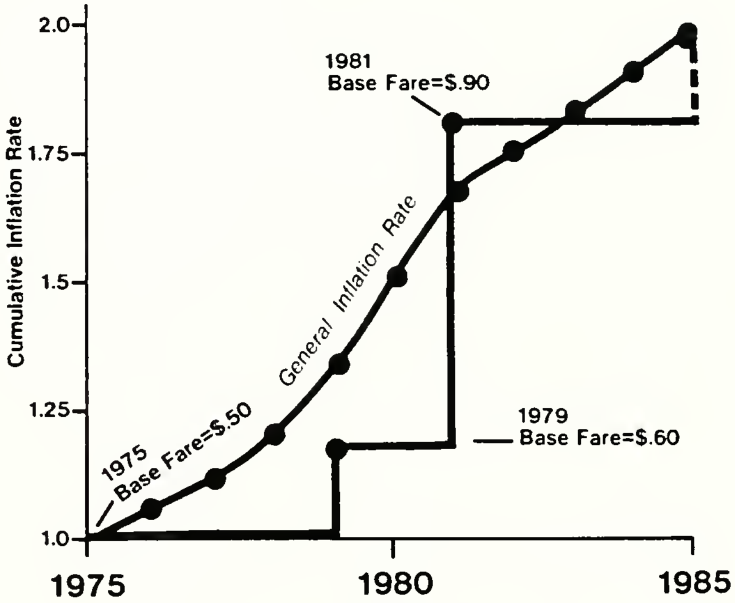
Fare Increase Option	Adult Bus Fare	Adult Rail Fare	Adult Rail Drop*	Transfer Price	% Ridership Change
Increase Transfer Price	.90	.90	-	.35	-2.8
Increase Rail Fare**	.90	1.15	.25	.10	-1.5
Across the Board***	1.00	1.00	--	.10	-3.0
Increase Transfer Price and Rail Fare****	.90	1.00	.10	.25	-2.4

* For passengers transferring from bus, and in association with using tokens (no change in token price).

** Reduced Fare rail fare at $.50.

*** Reduced Fares at $.50

**** Reduced Fare rail fare at $.45.



CTA Fare Increases vs. General Inflation

Approved:

Larry Pianto
Chief Administrative Officer

cta

Date: November 20, 1985

To: Fares Policies Task Force

From: Darwin G. Stuart, Manager, Strategic Planning DGS

Re: Reduced Fare Policies and Options

As the attached memo from Joyce Hughes confirms, the CTA Boad has the option of setting reduced fares (youth, elderly, disabled) at ratios that do or do not include the price of transfers in the calculation. For example, today's reduced fare of $.40 (one-half of the sum of the full fare of $.90 plus a $.10 transfer, then subtracting out the transfer price to get the base reduced fare) could legally have been set at $.45 (one-half of the $.90 full fare only).

For most of the alternatives, we have been examining (i.e. various levels of rail surcharge plus a transfer price increase of about a dime), today's reduced fare policy was assumed. That is, for a full rail fare of $1.00 and a transfer price of $.20 (for example), the reduced fare was calculated as one-half of the sum of $1.00 plus $.20 equals $.60; $.60 minus the transfer price of $.20 equals $.40 (same as today) as the base reduced fare. Under the alternative policy, the base reduced rail fare could be calculated as one-half of the $1.00 full fare equals $.50. Using today's policy led to conservative estimates of ridership loss and revenue gain.

It was necessary to make such assumptions, of course, because reduced-fare riders were considered explicitly in our impact analyses. Under our continuing analyses, we have now found that the policy option that yields higher base reduced fares (that is, forget the price of the transfer in the calculation) will both yield somewhat higher ridership losses as well as net revenue gains of about 25% over earlier estimates. For example, for the $1.00 rail fare with a $.20 transfer, the annual net revenue increase rises about 26%, to $23.8 Million. Under the second reduced fare policy. Associated ridership losses increase from -1.2% to -2.5%. Table 1 summarizes these differences for fare increase options presented to the CTA Board on 11/14/85.

In general, as the transfer price is increased, today's policy yields a base reduced fare that is lower than today's $.40. For example, assume a transfer price of $.45 and no increase in rail fares. ($.90 + $.45)/2 = $.65; $.65 - $.45 = $.20. With a base reduced fare of only $.20, there would be very little incentive to buy the $.45 transfer! One could make three unlinked transit trips for $.60, and still save a nickel over buying and using a transfer.

Because of this inconsistency, the second reduced fare policy option has been assumed in analyzing fare increase options with a transfer price of $.25 or greater. This yields both significantly higher ridership losses as well as net revenue gains (see Table 2). While it makes sense to question whether reduced-fare rider elasticities would really hold in these cases (or, in fact, whether they are really the same as full-fare rider elasticities), we have no better information available. Full-fare rider elasticities were consequently assumed, even though the greater transit dependency typically associated with reduced-fare riders suggests that lower fare elasticities (less ridership loss than estimated) might be appropriate.

Because, for our more promising fare increase options, these two alternative reduced fare policies appear to have significant ridership and revenue differences, they must be considered carefully in making a selection. In fact, it is also possible to consider intermediate reduced fares, falling between the values given by these two basic options. For example, in the example cited above, a $.45 reduced fare would represent a compromise between the $.40 and $.50 (all three with the same $.20 transfer price) yielded be the two basic policies. Tables 3 and 4 consequently summarize the impacts of three different reduced fare options, for the more promising rail drop plus transfer price increase options.

Choosing among these reduced-fare policies will be difficult, not only because of their apparent ridership and revenue differences, but also because of the broader policy issues associated with a major class of CTA's transit dependents (youth, elderly, disabled). Your thoughts on how to communicate all of this to the CTA Board will be appreciated.

DGS:df

ble 1

Comparison of Reduced Fare Policies

re crease tion	Adult Bus Fare	Adult Rail Fare	Adult Rail Drop*	Transfer Price	% Ridership Change	% Revenue Increase	Revenue Gain ($M)
days Reduced Fare Policy							
ansfer (c)	.90	1.00	.10	.20	-1.2	7.0	18.9
crease (m)	.90	1.05	.15	.20	-1.4	8.9	24.2
Modal (1) fferential	.90	1.10	.20	.15	-1.2	9.3	25.1
creased-Revenue Reduced Fare Policy							
ansfer (c)	.90	1.00	.10	.20	-2.5	8.8	23.8
crease (m)	.90	1.05	.15	.20	-2.6	10.6	28.6
Modal (1) ffererential	.90	1.10	.20	.15	-2.5	10.7	29.1

ble 2

Comparison of Transfer Price Increases

Adult Base Fare	Reduced Base Fare	Transfer Price	Percent Ridership Change	Percent Revenue Increase	Revenue Gain ($M)
day's Reduced Fare Policy					
.90	.25	.35	-.4	6.1	16.4
.90	.25	.40	-.9	7.9	21.4
.90	.20	.45	-.4	8.5	23.1
creased-Revenue Reduced Fare Policy					
.90	.40	.30	-2.3	7.5	20.5
.90	.40	.35	-2.8	9.4	25.5
.90	.40	.40	-3.2	11.2	30.5

able 3

Range of Reduced-Fare Options

are ncrease ption		[----------ADULT---------]			Common Transfer Price	[-------------REDUCED-------------]		
		Bus Fare	Rail Fare	Rail "Drop"		Bus Fare	Rail Fare	Rail "Drop"
ransfer ncrease Modal ifferential	(c)	.90	1.00	.10	.20	.45	.50	.05
		.90	1.00	.10	.20	.35	.40	.05
		.90	1.00	.10	.20	.40	.45	.05
	(m)	.90	1.05	.15	.20	.45	.50	.05
		.90	1.05	.15	.20	.35	.40	.05
		.90	1.05	.15	.20	.40	.45	.05
	(l)	.90	1.10	.20	.15	.45	.55	.10
		.90	1.10	.20	.15	.35	.45	.10
		.90	1.10	.20	.15	.40	.50	.10
	(n)	.90	1.00	.10	.25	.45	.50	.05
		.90	1.00	.10	.25	.30	.35	.05
		.90	1.00	.10	.25	.35	.40	.05
		.90	1.00	.10	.25	.40	.45	.05

able 4

are ncrease ption		Adult Bus Fare	Adult Rail Fare	Adult Rail Drop*	Transfer Price	% Ridership Change	% Revenue Increase	Revenue Gain ($M)
ransfer ncrease Modal ifferential	(c)	.90	1.00	.10	.20	-2.5	8.8	23.8
		.90	1.00	.10	.20	-1.2	7.0	18.9
		.90	1.00	.10	.20	-1.8	7.7	20.8
	(m)	.90	1.05	.15	.20	-2.6	10.6	28.6
		.90	1.05	.15	.20	-1.4	8.9	24.2
		.90	1.05	.15	.20	-2.1	9.5	25.6
	(l)	.90	1.10	.20	.15	-2.5	10.7	29.0
		.90	1.10	.20	.15	-1.2	9.3	25.1
		.90	1.10	.20	.15	-1.8	9.6	26.0
	(n)	.90	1.00	.10	.25	-3.0	10.6	28.8
		.90	1.00	.10	.25	- .9	7.8	21.1
		.90	1.00	.10	.25	-1.7	8.5	22.9
		.90	1.00	.10	.25	-2.4	9.6	25.9

* For passengers transferring from bus.

Chicago Transit Authority
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(312) 272 6109

[illegible] A. Hughes
[illegible]

OPINION NO. 1985-11-01

TO: Ernest R. Sawyer, Deputy Director
Planning and Development

FROM: Joyce A. Hughes, General Attorney

RE: Reduced Fares and UMT Act

DATE: November 13, 1985

You have requested an intepretation of Section 5 of the Urban Mass Transportation Act of 1964, as amended, 49 U.S.C. Sec. 1604. Specifically, your question is whether or not the CTA can charge elderly or handicapped riders full price for a transfer, so long as those passengers receive at least a fifty percent (50%) reduction on the regular fare. I conclude there is nothing in the Act which prohibits that approach.

I. PAST PRACTICE AND PROPOSALS

I understand that historically the reduced fare available to the elderly and/or handicapped has always been one-half of the combined cost of the regular fare plus a transfer. For example, a regular fare of 90¢ plus a 10¢ transfer results in a regular fare of $1.00, one-half of which is 50¢. Also, I understand that no more than fifty percent (50%) of CTA passengers use a transfer on a given day.

Under a hypothetical raised by facts in your memorandum to Leon Wool dated October 24, 1985, a proposed fare of 90¢ plus a 20¢ transfer would result in a total regular fare of $1.10. The question is whether or not the elderly or handicapped reduced fare can be one-half of the regular fare (45¢) plus a full fare transfer (20¢) resulting in a total fare of 65¢. Alternatively, you propose a situation under which a reduced fare passenger is charged 40¢ which is less than fifty percent (50%) of a 90¢ full fare plus a full fare 20¢ transfer resulting in a total reduced fare of 60¢. It is my opinion that either of these is permissible since you are not charging the elderly and handi-

capped more than one-half of the regular fare, and because less than fifty percent (50%) of our daily passengers use transfers. If, however a reduced fare rider is charged more than half the base fare, regardless of whether or not he/she uses a transfer, I believe the Act would prohibit such a practice.

II. UMTA ACT

Section 5 of the UMT Act provides for federal grants for construction or operating assistance to transit properties. That section gives the Secretary of Transportation several parameters within which to work, generally expressed as negatives, i.e., the Secretary is not permitted to approve projects unless he makes certain findings or he receives certain assurances. For purposes of this opinion, the pertinent Section is 5(m), 49 U.S.C. Sec. 1604(m). That Section provides in part:

> [T]he rates charged elderly and handicapped persons during non-peak hours for transportation . . . will not exceed 1/2 of the rates generally applicable to other persons at peak hours . . . .

Since the Authority does not have a differential fare based upon peak and non-peak hour use, there is a substantial question of whether or not the Section is applicable at all. However, for purposes of this opinion, I am assuming the applicability of this subsection to our single fare system.

The statutory comparison between peak and non-peak can be viewed as a comparison between a regular fare (peak) and a non-regular fare (non-peak). Since the "regular" fare is the base rate charged, and since it is the passenger's option to utilize a transfer or not, Section 5(m) of the Act can be interpreted to require only that the reduced be no more than fifty percent (50%) of the "regular". In addition, it is important that less than half of the passengers use transfers, because that makes it possible to conclude that a transfer is not part of the "regular" fare or rate.

This interpretation is not free from doubt since the statute does not speak in terms of fares but "rates." UMTA could logically take the position that both the base fare and the

transfer combine to establish a "rate" for transportation. My interpretation has not been discussed with UMTA, and there is always the possibility that UMTA will interpret the statute as indicated above. Further, UMTA may well take the position that CTA is estopped from changing the basis of calculating the fares since (I presume) the facilities on which the elderly and handicapped persons are riding were purchased at a time when the method of calculating the fare was to total the base fare plus transfer and to take one-half of that sum.

III. CONCLUSIONS AND RECOMMENDATION

Notwithstanding the difficulties mentioned in the preceding section, my conclusions can be summarized as follows:

1. It is possible to take the position that Section 5(m) of the UMT Act does not apply to our system, which does not differentiate between peak and non-peak fares.
2. Elderly and handicapped riders can be charged the full fare for transfers, so long as the base fare is fifty percent (50%) or less of the regular fare.
3. If the initial fare paid permits the handicapped/elderly rider to travel without a transfer, then the reduced fare must be at least fifty percent (50%) of the total combined base regular fare, plus base transfer fare.

Prior to instituting a change in the method of calculating reduced fares, I recommend that we seek a formal opinion from the Regional Counsel of UMTA. Please advise if you plan to follow this recommendation, since the request for an opinion should be drafted by my office.

Joyce A. Hughes
Joyce A. Hughes

JAH:fms

Chicago Transit Authority
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ANALYSIS OF SHORT-RANGE FARE INCREASE OPTIONS

Fare Policies Task Force
October, 1985

EXECUTIVE SUMMARY

The Fare Policies Task Force has reviewed a series of fare increase options, with the objective of generating additional system farebox revenues with minimal loss in CTA ridership. With the prospect that fares may need to be increased in early 1986, emphasis has been given to only those fare increase options that can be implemented within a fairly short time. Distance-based or zone-based fare structures have consequently been excluded, though such longer-term options are receiving separate study. They may well merit serious attention at a later date.

Five different short-term fare increase options were considered, and two are identified here as most promising for potential implementation. The five options are:

- increase the price of transfers (justification: transfer prices have not increased since 1970, while the base fare has doubled since then).

- increase rail fares over bus fares (justification: rail provides a faster service than bus, and the average rail passenger trip is twice as long as for bus).

- increase peak-hour fares over off-peak fares (justification: peak-hour service is more costly to provide, competes more effectively with the alternative automobile mode (is worth more), and largely serves employed persons (work trips) who are better able to afford a fare increase).

- increase present base fares (justification: increasing present bus and rail fares by a single, across-the-board amount, such as $.10, would be easiest to implement and understand).

- lower both bus and rail fares, but eliminate the transfer (justification: by requiring a full fare payment for each transit vehicle trip, additional revenue would be generated by multiple-vehicle trips (trips with transfers), while permitting single-vehicle transit users to pay less).

Using the following criteria, this list of five options (selected combinations of some options were also studied) was reduced to two: transfer price increase and modal differential (rail fares higher than bus). Table I summarizes the strengths and weaknesses of each general type of fare increase. (It is important to realize that specific examples for each type of fare structure were tested, with about 30 different options investigated using a computer program. This analysis included consideration of demand elasticities, full vs. reduced fares, bus vs. rail ridership differences, and classification of bus and rail trips by the number of transfers involved.)

- Ability to generate significant additional revenue with minimal ridership loss (Target: revenue gain of about $20 Million per year with no more than a 2% loss in ridership.) Transfer price (by itself), across-the-board, and no transfer fare increases did not meet this criterion.

- Extent of operating problems associated with implementation (Target: fare increase should be implementable within 60 days, preferably less.) Peak/off-peak fare differentials did not meet this criterion, due to operations problems associated with fare collection equipment, operating procedures, and training practices. While not insurmountable, these problems, together with additional complexities associated with pass and token pricing, would require a longer implementation period.

Table 2 summarizes the four specific fare increase policies which showed the greatest potential for meeting each of the above criteria. Note that two of these options involve a reduction in the present bus fare to $.80. This would be a major positive feature of these strategies, and could be emphasized in promotional/public information campaigns. Rail fares would be as much as $.20 - $.45 higher than bus fares, and the price of a transfer could go up to $.20. Table 2A then lists other possible fare increase combinations, as variations of these basic options.

Table 3 summarizes the ridership and revenue impacts estimated for each of these four options. A range of impacts is shown, reflecting both the 42-55% range of transfer rates displayed by existing ridership data, as well as other uncertainties associated with the forecasting process. Changes in ridership due to such fare increases are estimated to be quite small, ranging from a possible slight increase (0.2%) to a 2% loss. Associated annual revenue gains range from $19-34 Million. Table 3A then gives comparable ridership/revenue estimates for the other possible fare increase combinations.

Table 4 lists some of the key related pricing policies for each of the four options. This includes corresponding reduced fares for students, elderly, and handicapped. Monthly pass pricing (with separate bus-only and bus-rail passes) is suggested which would roughly maintain the existing monthly pass usage at 20% of all boarding passengers. The adult monthly pass price could vary from $35.50 to $57.00. Corresponding token prices are also given. (Note: Further discounting of monthly passes or tokens to increase their uses was not analyzed, and represents a separate set of policy choices.) Table 4A again lists related pricing for the other possible fare increase options.

While not essential for implementing either of the preferred fare increase policies, the Task Force also agreed that exact fare collection at rail stations should eventually be made an integral part of future fare policies. It was found that peak/off-peak fare differentials, in particular, would probably aggravate present cash-handling and auditing problems. For any future fare structure, however, simplification (exact fare) of fare collection procedures will benefit both passengers and operators. As an example, a GFI farebox could be placed just outside each ticket agent booth, and ticket agents would make change only, handle transfers, and verify reduced fare status.

The two preferred fare increase options were culled from a much larger set, as indicated earlier, through a process of successive analyses. Various memos which document these analysis steps are attached to provide further details. In particular, these attachments cover:

- Detailed computer analysis results of ridership/revenue impacts for the preferred options (September 25).
- Ridership and revenue projections for a larger set (11) of increased transfer prices, higher rail fares, and combinations of these two strategies (September 20).
- Review of related service/fare issues, covering express surcharges, shuttle fares, supertransfers, and the like (September 23).
- Task Force conclusions regarding the two most promising fare increase options (September 17).
- Corresponding monthly pass pricing for nine different fare increase options (September 10).
- Review of key implementation issues, as identified by Task Force members (September 9), also including:

  Elasticities used for CTA fare structure analysis;

  Experience of other regions in implementing time-of-day fare differentials;

  Annual revenue estimates for promising fare increase options;

  "No Transfer" fare structure issues.
- Report of initial revenue and ridership impact analysis for 24 different fare increase options, including combinations (August 27), also including:

  Listing of advantages and disadvantages of major fare structure changes, as identified by Task Force members.

  Detailed computer analysis results for all 24 options.
- Review of CTA Fare Structures, 1970-1984 (July 26).

TABLE I

STRENGTHS AND WEAKNESSES OF SHORT-TERM FARE INCREASE OPTIONS

Fare Increase Option	Range of Increase ($)	Estimated Daily Ridership Change (%)	Estimated Annual Revenue Increase ($ Million)	Operating Problems	Other Implementation Issues
Increase Transfer Price	+.10 to +.30	-1.9 to +1.6	+20.3 to -1.0	Increased potential for fraudulent use and illegal sale of transfers.	Transferring riders may feel they are being discriminated against.
Increase Rail Fares	+.20 to +.35	-0.1 to +1.9	+33.9 to +10.8	Requires some reprogramming of fare types, and re-instruction of fare collecting employees.	Adds complexity to pass and token pricing, and to transfer usage.
Increase Peak-Hour Fares	+.10 to +.30	-1.0 to -2.8	+14.3 to +42.3	Potential passenger/employee conflicts over peak/off-peak transition. Requires major reprogramming of fare collection equipment, revisions to fare collection and auditing procedures, and retraining of fare collecting employees.	Method of communication of peak/off-peak transition time. Adds complexity to pass and token pricing.
Increase Bus and Rail Fares	+.05 to +.15	-1.2 to -3.4	+10.6 to 32.4		
Lowered Fares, No Transfer	-.40 to +.10	+5.2 to -3.8	-33.3 to +28.1		Transferring riders will feel they are being discriminated against; significant equity questions involved.

NOTE: See the Tables on pp. 8-15, 17-18, 29, and 55-56 for further details.

TABLE 2

SUMMARY OF MOST PROMISING FARE INCREASES

Fare Increase Option		Adult Bus Fare	Adult Rail Fare	Adult Rail Drop*	Transfer Price
Modal Differential	(a)	0.80	1.25	0.45	0.10
Transfer Increase + Modal Differential	(b)	0.80	1.10	0.30	0.20
	(c)	0.90	1.00	0.10	0.20
	(d)	0.90	1.10	0.20	0.20

* For passengers transferring from bus.

TABLE 2A

OTHER POSSIBLE FARE INCREASE COMBINATIONS

Fare Increase Option		Adult Bus Fare	Adult Rail Fare	Adult Rail Drop	Transfer Price
Modal Differential	(e)	0.80	1.20	0.40	0.10
	(f)	0.80	1.15	0.35	0.10
	(g)	0.85	1.25	0.35	0.10
	(h)	0.90	1.20	0.30	0.10
Transfer Increase + Modal Differential	(i)	0.80	1.15	0.35	0.20
	(j)	0.80	1.20	0.40	0.15
	(k)	0.85	1.15	0.30	0.15
	(l)	0.90	1.10	0.20	0.15
	(m)	0.90	1.05	0.15	0.20

TABLE 3

SUMMARY OF RIDERSHP AND REVENUE IMPACTS FOR PROMISING FARE OPTIONS

Fare Increase Option		% Ridership Change	% Revenue Increase	Annual Revenue Gain ($ Million)
Modal Differential	(a)	-0.1 to -0.5	10.6 to 11.7	28.6 to 31.6
Transfer Increase + Modal Differential	(b)	+0.2 to -0.5	7.2 to 9.1	19.5 to 24.6
	(c)	-1.2 to -1.6	7.0 to 8.3	18.9 to 22.5
	(d)	-1.8 to -2.3	11.2 to 12.7	30.2 to 34.3

NOTE: Ranges reflect different assumptions regarding the percent of originating pasengers who transfer, from a "conservative" 42% up to 55%. These percentages reflect differences in existing data sources, including a preliminary survey of differences between transfer purchase and actual transfer usage.

TABLE 3A

RIDERSHIP AND REVENUE IMPACTS FOR OTHER POSSIBLE FARE INCREASE COMBINATIONS

Fare Increase Option		% Ridership Change	% Revenue Increase	Annual Revenue Gain ($ Million)
Modal Differential	(e)	+0.1 to -0.5	8.7 to 10.4	23.5 to 28.1
	(f)	-0.4 to -0.9	7.6 to 9.2	20.6 to 24.9
	(g)	-1.3 to -2.0	11.1 to 13.0	30.0 to 35.2
	(h)	-1.9 to -2.4	12.6 to 14.0	34.2 to 38.0
Transfer Increase + Modal Differential	(i)	0.0 to -1.2	9.1 to 12.4	24.7 to 33.7
	(j)	+0.3 to -0.7	9.4 to 12.1	25.6 to 32.9
	(k)	-0.9 to -1.6	10.0 to 11.9	26.9 to 32.0
	(l)	-1.2 to -1.9	9.3 to 11.2	25.1 to 30.2
	(m)	-1.4 to -2.2	8.9 to 11.4	24.2 to 30.9

TABLE 4

RELATED PRICING POLICIES FOR PROMISING FARE INCREASES

Fare Increase Option		Reduced Bus Fare	Reduced Rail Fare	Reduced Rail Drop*	Monthly Pass Prices				Token Pricing	
					Adult Bus Only	Adult Bus/Rail	Reduced Bus Only	Reduced Bus/Rail	Adult Bus Only** (Pack of 10)	Reduced Bus Only**
Modal Differential	(a)	.35	.55	.20	35.50	57.00	16.00	25.00	7.50	.35
Transfer Increase + Modal Differential	(b)	.30	.45	.15	36.50	52.50	15.50	23.00	7.50	.30
	(c)	.35	.40	.05	41.00	47.50	17.50	20.50	8.50	.35
	(d)	.35	.45	.10	41.00	52.00	17.50	22.50	8.50	.35

* For passengers transferring from bus.

** Rail drop would also be required.

TABLE 4A

RELATED PRICING POLICIES FOR OTHER POSSIBLE FARE INCREASE COMBINATIONS

Fare Increase Option		Reduced Bus Fare	Reduced Rail Fare	Reduced Rail Drop*	Monthly Pass Prices				Token Pricing	
					Adult Bus Only	Adult Bus/Rail	Reduced Bus Only	Reduced Bus/Rail	Adult Bus Only** (Pack of 10)	Reduced Bus Only**
Modal Differential	(e)	.35	.55	.20	35.50	55.00	16.00	25.00	7.50	.35
	(f)	.40	.55	.15	35.50	52.50	18.00	25.00	7.50	.40
	(g)	.40	.55	.15	37.50	54.50	18.00	25.00	8.00	.40
	(h)	.40	.55	.15	39.50	54.50	18.00	25.00	8.50	.40
Transfer Increase + Modal Differential	(i)	.30	.45	.15	36.50	55.00	15.50	23.00	7.50	.30
	(j)	.30	.50	.20	36.00	56.00	14.50	24.00	7.50	.30
	(k)	.35	.50	.15	38.00	53.50	17.00	24.00	8.00	.35
	(l)	.35	.45	.10	40.00	51.00	17.00	21.50	8.50	.35
	(m)	.35	.40	.05	41.00	49.50	17.50	20.50	8.50	.35

---

* For passengers transferring from bus

** Rail drop would also be required

Date: September 26, 1985

To: Fare Policies Task Force

From: Darwin G. Stuart, Manager, Strategic Planning DGS

Re: Detailed Ridership and Revenue Forecasts for Promising Fare Increase Options

Attached for your review are the detailed computer print-outs for several of the most promising fare increase options we have identified, as reported in my September 20, 1985 memo. Comparable results for all of the options covered in that memo are also available, if needed.

The following print-outs are included, in this order:

Adult Bus Fare	Adult Rail Drop	Transfer Price	% Change Ridership	% Change Revenue
42% Transfer Rate Assumed				
0.80	0.45	0.10	-0.1	10.58
0.80	0.30	0.20	0.2	7.20
0.90	0.10	0.20	-1.2	6.97
0.90	0.20	0.20	-1.8	11.15
65% Transfer Rate Assumed				
0.80	0.45	0.10	-0.8	12.51
0.80	0.30	0.20	-1.0	10.54
0.90	0.10	0.20	-2.0	9.30
0.90	0.20	0.20	-2.7	13.82

DGS:df

```
                                         43     06 AUG 85  HALL                  1001160
.DATE 06 AUG 85  11:11:43 .RID                             BY: NKH                REVENUE      . P E R   C E N T   C H A N G E S :
.U850917 FARE STRUCTURE6: transfer                   .NEW VOLUMES.                    NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .ADULT. RED..INITIAL.         .=====.=====.====.====.======.
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..=====.=====.=======.=======.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.
 1 0 1 t -0.2900  .90   .40   232    91      0.90  .33  232.0 96.24 245.200 240.549     0 -17.5    0 5.73 -1.897
 0 1 1 t -0.1200  .90   .40   143    22      0.90  .33  143.0 22.51 137.500 136.128     0 -17.5    0 2.32 -0.998
 2 0 2 t -0.2900 1.00   .50    92    67      1.15  .58  88.35 64.18 125.500 138.827 15.00 16.00 -4.0 -4.2 10.619
 1 1 2 t -0.2050 1.00   .50    96    14      1.15  .58  93.29 13.58     103 115.160 15.00 16.00 -2.8 -3.0 11.806
 0 2 2 t -0.1200 1.00   .50    12     1      1.15  .58  11.80 0.982 12.5000 14.1396 15.00 16.00 -1.7 -1.8 13.117
 3 0 3 t -0.2900 1.00   .50     9     6      1.15  .58  8.643 5.748      12 13.2733 15.00 16.00 -4.0 -4.2 10.611
 2 1 3 t -0.2333 1.00   .50    28     7      1.15  .58  27.10 6.762 31.5000 35.0870 15.00 16.00 -3.2 -3.4 11.387
 1 2 3 t -0.1767 1.00   .50    11     1      1.15  .58  10.73 0.974 11.5000 12.9044 15.00 16.00 -2.5 -2.6 12.212
 4 0 4 t -0.2900 1.00   .50     1            1.15  .58  0.960     0       1 1.10400 15.00 16.00 -4.0    0 10.400
 3 1 4 t -0.2475 1.00   .50     2            1.15  .58  1.932     0       2 2.22180 15.00 16.00 -3.4    0 11.090
 2 2 4 t -0.2050 1.00   .50     8     2      1.15  .58  7.774 1.940       9 10.0653 15.00 16.00 -2.8 -3.0 11.837
                                                                                                     ---------  -------
.                                                       ----- ----- ------- -------                    -0.8     4.164
*GRAND-TOTAL  -              -----  -----               625.6 212.9 690.700 719.459
*                              634   211*
                    ..... END REPORT .....
```

```
*[illegible] FARE STRUCTURES: [illegible]
                                                          [illegible]
*SERVICE.FLEET- .JOINT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE
*B.R.I.X.ZCITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL. NEW   [illegible]
*=.=.=.=.========.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.=====.=====.======.
 1 0 1 t -0.2900  .90  .40   232   91     0.80  .25  240.1 104.1 245.200 245.405 -11.1 -37.5 3.49 14.4 -11.05
 0 1 1 t -0.1200  .90  .40   143   22     0.80  .25  145.0 23.25 137.500 121.612 -11.1 -37.5 1.40 5.68 -11.44
 2 0 2 t -0.2900 1.00  .50    92   67     1.20  .50  87.27    67 125.500 130.724 20.00     0 -5.1    0 10.429
 1 1 2 t -0.2050 1.00  .50    96   44     1.20  .50  92.49    44     103 117.965 20.00     0 -3.7    0 14.552
 0 2 2 t -0.1200 1.00  .50    12    1     1.20  .50  11.74     1 12.5000 14.5500 20.00     0 -2.2    0 15.704
 3 0 3 t -0.2900 1.00  .50     9    6     1.20  .75  8.538 5.542      12 14.2521 20.00    50 -5.4 -11. 18.766
 2 1 3 t -0.2333 1.00  .50    28    7     1.20  .75  26.84 6.376 31.5000 36.9900 20.00    50 -4.1 -8.9 17.429
 1 2 3 t -0.1767 1.00  .50    11    1     1.20  .75  10.65 0.932 11.5000 13.4790 20.00    50 -3.2 -6.8 17.209
 4 0 4 t -0.2900 1.00  .50     1          1.20 1.00  0.949     0       1 1.43280 20.00  -100 -5.1    0 13.560
 3 1 4 t -0.2475 1.00  .50     2          1.20 1.00  1.942     0       2 2.29440 20.00  -100 -4.4    0 14.720
 2 2 4 t -0.2050 1.00  .50     8    2     1.20 1.00  7.70  3.031       9 9.24840 20.00  -100 -3.7 51.6 2.7600
.
*GRAND-TOTAL  - -             ----  -----            ----- ----- ------- -------                 --------- -----
*                              634   211*            633.2 225.0 690.700 608.124                     1.6  -0.373
                  ..... END REPORT .....
```

```
   16 SEP 85  09:53:28  RID      42    16 SEP 85  HALL
 .  FARE STRUCTURES: mode                          BY: RNH               1004400
   . . .LAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.      REVENUE       . P E R   C E N T   C H A N G E
 . . . .  .CITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.   NEW   .AFARE.RFARE.AVOL.RVOL.TOTREV.
*=.=.=.=.======.=====.=====.=====.=======.=====.=====.=====.=====.========.========.======.=====.=====.====.======.=
 1 0 1 m -0.2900 .90   .40    232    91        0.750 0.300 244.6 98.87 245.200 213.111 -16.7    -25 5.43 8.65 -13.09
 0 1 1 m -0.1200 .90   .40    143    22        1.150 0.500 138.9 21.42 137.500 170.445 27.78 25.00 -2.9 -2.6 23.960
 2 0 2 m -0.2900 1.00  .50    92     67        0.850 0.400 96.43 71.46 125.500 110.550 -15.0 -20.0 4.82 6.66 -11.91
 1 1 2 m -0.2050 1.00  .50    96     14        1.250 0.600 91.72 13.49     103 122.744    25 20.00 -4.5 -3.6 19.169
 0 2 2 m -0.1200 1.00  .50    12     1         1.650 0.800 11.31 0.946 12.5000 19.4183 65.00 60.00 -5.8 -5.4 55.346
 3 0 3 m -0.2900 1.00  .50    9      6         0.850 0.400 9.433 6.400      12 10.5781 -15.0 -20.0 4.81 6.67 -11.85
 2 1 3 m -0.2333 1.00  .50    28      7        1.250 0.600 26.59 6.709 31.5000 37.2629    25 20.00 -5.0 -4.2 18.295
 1 2 3 m -0.1767 1.00  .50    11      1        1.650 0.800 10.09 0.922 11.5000 17.3861 65.00 60.00 -8.3 -7.8 51.184
 4 0 4 m -0.2900 1.00  .50     1               0.850 0.400 1.048     0       1 0.89080 -15.0 -20.0 4.80    0 -10.92
 3 1 4 m -0.2475 1.00  .50     2               1.250 0.600 1.893     0       2 2.36625    25 20.00 -5.4    0 18.313
 2 2 4 m -0.2050 1.00  .50     8      2        1.650 0.800 7.234 1.819       9 13.3913 65.00 60.00 -9.6 -9.1 48.792
.
*GRAND-TOTAL  -              ----   ------          ----- ----- -------- --------             ---------- ------
*                             634    211*           639.3 222.0 690.700 718.144                     1.9    3.973
                 ..... END REPORT .....
```

```
*SERVICE.LEAST- .INIT. [illegible] VOL.[illegible] TIMES .[illegible]
*D.E.T.X.IOTTILES.ADULT. [illegible]
*=.=.=.=.=========.=======.======.=====.=====  ======.=====  ======.======.=====.=====.======.======.=====.=====.====.====.======.
 1 0 1 m -0.2900 .90   .40   [illegible] [illegible]    0.600 0.350 140.4 94.5  [illegible] [illegible] [illegible] -12.5 1.40 [illegible] -8.162
 0 1 1 m -0.1200 .90   .40   143   22     1.250 0.550 187.5 24.19 137.200 165.524 26.09 27.00 -3.8 -3.? 33.472
 2 0 2 m -0.2900 1.00  .50   92    67     0.900 0.450 94.85 69.08 425.[illegible] 446.454 -10.0 -10.0 3.10 3.10 -7.240
 1 1 2 m -0.2050 1.00  .50   96    14     1.350 0.650 90.34 43.27     102 130.544 25.00 20.00 -5.9 -5.2 26.742
 0 2 2 m -0.1200 1.00  .50   42    4      1.800 0.850 41.20 6.940 42.5000 20.9190 60.00 70.00 -6.7 -6.0 67.672
 3 0 3 m -0.2900 1.00  .50   9     6      0.900 0.450 9.279 6.486      12 11.4248 -10.0 -10.0 3.10 3.10 -7.240
 2 1 3 m -0.2333 1.00  .50   28     7     1.350 0.650 26.42 6.587 24.5000 35.5436 25.00 30.00 -6.7 -5.9 25.535
 1 2 3 m -0.1767 1.00  .50   11     1     1.800 0.850 9.943 0.912 11.5000 48.6726 60.00 70.00 -9.6 -8.8 62.870
 4 0 4 m -0.2900 1.00  .50    1           0.900 0.450 1.034     0       1 0.92790 -10.0 -10.0 3.10    0 -7.240
 3 1 4 m -0.2475 1.00  .50    2           1.350 0.650 1.858     0       2 2.50830 35.00 30.00 -7.1    0 25.445
 2 2 4 m -0.2050 1.00  .50    8     2     1.800 0.850 7.145 1.798       9 14.3355 60.00 70.00 -11.  -10. 59.264
.
*GRAND-TOTAL  -              -----   ------               ----- ----- ------- ------                    --------- ------
*                            634 .   244*                 629.3 244.5 690.700 723.788                        -0.1  10.582
                     ..... END REPORT .....
```

```
.DATE 17 SEP 85  11:24:32  SIP      82     17 SEP 85  HALL
.0850917 FARE STRUCTURES: transfer                    BY: NKH                    1001120
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.      REVENUE       . P E R   C E N T   C H A N G E
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.=====.=====.======.
 1 0 1 t -0.2900 .90   .40   140.7  55.2   0.80  .25   145.6 57.38 148.740 126.563 -11.1 -12.5 3.40 3.95 -0.460
 0 1 1 t -0.1200 .90   .40    86.7  43.3   1.25  .55   83.38 42.84 83.3500 111.271 38.89 37.50 -3.8 -3.7 33.499
 2 0 2 t -0.2900 1.00  .50   142.7 403.9   0.90  .45   147.4 407.1 194.650 180.585 -10.0 -10.0 3.08 3.08 -7.276
 1 1 2 t -0.2050 1.00  .50   148.9  24.7   1.35  .65   140.1 20.57 159.750 207.506 35.00 30.00 -5.9 -5.2 26.764
 0 2 2 t -0.1200 1.00  .50    18.6   1.5   1.80  .85   17.37 1.440 19.3500 32.4645 80.00 70.00 -6.6   -6 67.775
 3 0 3 t -0.2900 1.00  .50    14.0   9.3   0.90  .45   14.43 9.588 18.6500 17.3016 -10.0 -10.0 3.07 3.10 -7.230
 2 1 3 t -0.2333 1.00  .50    43.4  10.8   1.35  .65   40.49 10.16 48.8000 61.2655 35.00 30.00 -6.7 -5.9 25.544
 1 2 3 t -0.1767 1.00  .50    17.1   1.5   1.80  .85   15.46 1.369 17.8500 28.9917 80.00 70.00 -9.6 -8.7 62.419
 4 0 4 t -0.2900 1.00  .50     1.5         0.90  .45   1.547     0 1.50000 1.39230 -10.0 -10.0 3.13    0 -7.180
 3 1 4 t -0.2475 1.00  .50     3.1         1.35  .65   2.880     0 3.10000 3.08800 35.00 30.00 -7.1    0 25.419
 2 2 4 t -0.2050 1.00  .50    12.4   3.1   1.80  .85   11.03 2.787 13.9500 22.2230 80.00 70.00 -11. -10. 59.305

*GRAND-TOTAL  -              ------- --------              ----- ----- ------- -------             --------- ------

                               629.1 220.300*              619.4 223.2 709.660 798.452                  -0.8   12.512
                         ..... END REPORT .....
```

```
.DATE . . P PS  11:42:16  RID     82     17 SEP 85  HALL
.[illegible]. FARE STRUCTURES: transfer              BY: PGH            1004100
-ROW.COL.LEAST- .INIT. FARES.INITIAL VOL.S.NEW FARES .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G
+B.R.T.... CITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.DFARE.AVOL.DVOL.TOTREV
*=.=.=. .======.=====.=====.=====.=======.=====.=====.=====.=====.=======.========.=====.=====.====.====.======
 1 0 1 t -0.2900 .90    .40    140.7  55.2    0.80   .30    145.6 59.97 148.710 134.471 -11.1    -25 3.48 8.64 -9.575
 0 1 1 t -0.1200 .90    .40     86.7  13.3    1.10   .45    84.64 13.11 83.3500 99.0035 22.22  12.50 -2.4 -1.4 18.780
 2 0 2 t -0.2900 1.00   .50    142.7 103.9    1.00   .50    142.7 103.9 194.650 194.650     0      0    0    0      0
 1 1 2 t -0.2050 1.00   .50    148.9  21.7    1.30   .65    141.1 20.57 159.750 196.801 30.00  30.00 -5.2 -5.2 23.193
 0 2 2 t -0.1200 1.00   .50     18.6   1.5    1.60   .80    17.60 1.449 19.3500 29.2952 60.00  60.00 -5.4 -5.4 51.396
 3 0 3 t -0.2900 1.00   .50     14.0   9.3    1.00   .50       14 9.300 18.6500 18.6500     0      0    0    0      0
 2 1 3 t -0.2333 1.00   .50     43.4  10.8    1.30   .65    40.84 10.16 48.8000 59.6960 30.00  30.00 -5.9 -5.9 22.328
 1 2 3 t -0.1767 1.00   .50     17.1   1.5    1.60   .80    15.76 1.383 17.8500 26.3224 60.00  60.00 -7.8 -7.8 47.464
 4 0 4 t -0.2900 1.00   .50      1.5          1.00   .50    1.500     0 1.50000 1.50000     0      0    0    0      0
 3 1 4 t -0.2475 1.00   .50      3.1          1.30   .65    2.906     0 3.10000 3.77780 30.00  30.00 -6.3    0 21.865
 2 2 4 t -0.2050 1.00   .50     12.4   3.1    1.60   .80    11.28 2.820 13.9560 20.3040 60.00  60.00 -9.0 -9.0 45.548
.
*GRAND-TOTAL  -                ------- --------              ----- ----- ------- -------              --------- ------
*                               629.1 220.300*              617.9 222.6 709.660 784.471                 -1.0   10.542
                       ..... END REPORT .....
```

```
.DATE 17 SEP 85  13:54:03  RID      82     17 SEP 85  HALL
.0050947 FARE STRUCTURES: transfer                    BY: NKH               I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.=
 1 0 1 t -0.2900 .90    .40    140.7  55.2   0.90  .35   140.7 57.38 148.710 146.713     0 -12.5     0 3.95 -1.343
 0 1 1 t -0.1200 .90    .40     85.7  13.3   1.00  .40   85.61 13.30 83.3500 90.9300 11.11     0 -1.3     0 9.0942
 2 0 2 t -0.2900 1.00   .50    142.7 103.9   1.10  .55   138.8 101.+ 194.650 208.285 10.00 10.00 -2.7 -2.7 7.0049
 1 1 2 t -0.2050 1.00   .50    148.9  21.7   1.20  .60   143.5 20.91 159.750 184.746 20.00 20.00 -3.6 -3.6 15.647
 0 2 2 t -0.1200 1.00   .50     18.6   1.5   1.30  .65   18.03 1.454 19.3500 24.3841 30.00 30.00 -3.1 -3.1 26.016
 3 0 3 t -0.2900 1.00   .50     14.0   9.3   1.10  .55   13.62 9.047 18.6500 19.9579 10.00 10.00 -2.7 -2.7 7.0129
 2 1 3 t -0.2333 1.00   .50     43.4  10.8   1.20  .60   41.60 10.35 48.8000 56.1300 20.00 20.00 -4.1 -4.2 15.021
 1 2 3 t -0.1767 1.00   .50     17.1   1.5   1.30  .65   16.33 1.432 17.8500 22.1598 30.00 30.00 -4.5 -4.5 24.145
 4 0 4 t -0.2900 1.00   .50      1.5         1.10  .55   1.459     0 1.50000 1.60490 10.00 10.00 -2.7     0 6.9933
 3 1 4 t -0.2475 1.00   .50      3.1         1.20  .60   2.964     0 3.10000 3.55680 20.00 20.00 -4.4     0 14.736
 2 2 4 t -0.2050 1.00   .50     12.4   3.1   1.30  .65   11.75 2.939 13.9500 17.1654 30.00 30.00 -5.2 -5.2 23.193
.
*GRAND-TOTAL                  ------- --------             ----- ----- ---------------                 --------- ------
*                               629.1 220.300*             614.4 217.9 709.660 775.653                     -2.0  9.299
                    ..... END REPORT .....
```

```
. [illegible] 17 SEP 85  14:16:48  RID      12     17 SEP 85  HALL
..[illegible] 7 FARE STRUCTURES: transfer                  FY: [illegible]           [illegible]
.[illegible]E.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E
*[illegible].T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.RFARE.AVOL.RVOL.TOTREV.
*  .  .  .=======.=====.=====.======.=======.=====.=====.=====.=====.=======.=======.=====.=====.=====.=====.=====.
 1 0 1 t -0.2900 .90   .40   140.7  55.2   0.90  .35   140.7 57.38 148.740 146.743     0 -12.5     0 3.95 -1.343
 0 1 1 t -0.1200 .90   .40    86.7  13.3   1.10  .45   84.64 13.11 83.3500 99.0035 22.22 12.50 -2.4 -1.4 18.780
 2 0 2 t -0.2900 1.00  .50   142.7 103.9   1.10  .55   138.8 101.1 194.650 208.285 10.00 10.00 -2.7 -2.7 7.0049
 1 1 2 t -0.2050 1.00  .50   148.9  21.7   1.30  .65   141.1 20.57 159.750 196.801 30.00 30.00 -5.2 -5.2 23.193
 0 2 2 t -0.1200 1.00  .50    18.6   1.5   1.50  .75   17.73 1.430 19.3500 27.6675    50    50 -4.7 -4.7 42.985
 3 0 3 t -0.2900 1.00  .50    14.0   9.3   1.10  .55   13.62 9.047 18.6500 19.9579 10.00 10.00 -2.7 -2.7 7.0129
 2 1 3 t -0.2333 1.00  .50    43.4  10.8   1.30  .65   40.84 10.16 48.8000 59.6960 30.00 30.00 -5.9 -5.9 22.328
 1 2 3 t -0.1767 1.00  .50    17.1   1.5   1.50  .75   15.93 1.398 17.8500 24.9435    50    50 -6.8 -6.8 39.740
 4 0 4 t -0.2900 1.00  .50     1.5         1.10  .55   1.459     0 1.50000 1.60490 10.00 10.00 -2.7    0 6.9933
 3 1 4 t -0.2475 1.00  .50     3.1         1.30  .65   2.906     0 3.10000 3.77780 30.00 30.00 -6.3    0 21.865
 2 2 4 t -0.2050 1.00  .50    12.4   3.1   1.50  .75   11.42 2.856 13.9500 19.2720    50    50 -7.9 -7.9 38.151
.
+GRAND-TOTAL  =             -------- --------           ----- ----- ------- -------             --------- ------
*                             629.1 220.300*            609.1 217.1 709.660 807.722                  -2.7 13.818
                 ..... END REPORT .....
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Date: September 20, 1985

To: Fares Policies Task Force

From: Darwin G. Stuart, Manager, Strategic Planning DGS

Re: Ridership and Revenue Projections for
Two Fare Increase Options

Attached are additional ridership and revenue projections for several new variations of the two basic fare increase options that we settled on at our last meeting on September 13, 1985. These options are: (a) increase the price of transfers, and (b) increase rail fares, while also reducing bus fares. Several combinations of these two overall strategies are also examined.

A range of ridership and revenue impacts is given in Tables 1 and 2. The range reflects different assumptions regarding present (and future) transfer percentages for CTA passengers--from 45% to 65% of all originating riders. Such a range might also be associated with other uncertainties in the forecasting process, such as the stability of elasticities used in estimating ridership impacts. The most likely ridership and revenue impacts probably fall somewhere within the ranges shown.

The Task Force also agreed that exact fare collection at rail stations should be made an integral part of future fare policies. It was found that peak/off-peak fare differentials, in particular, would probably aggravate present cash-handling and auditing problems. For any future fare structure, however, simplification (exact fare) of fare collection procedures will benefit both passengers and operators.

DGS:df

8422 (rev. 03/85)

LE 1 RIDERSHIP AND REVENUE ESTIMATES OF SELECTED FARE STRUCTURES (42% TRANSFER RATE)

	Adult Bus Fare	Adult Rail Drop	Transfer Price	% Change Ridership	% Change Revenue	Total Annual Revenue ($ M)	Annual Revenue Gain ($M)
nsfer	0.90	0	0.25	0.8%	4.16	281.96	10.26
rease	0.80*	0	0.40	1.6	-0.37	269.70	-1.00
y	0.90	0	0.20**	-0.9	4.60	283.15	12.45
	0.80	0.30	0.10	0.6	4.53	282.96	12.26
al	0.75	0.40	0.10	1.9	3.97	281.45	10.75
ferential	0.80	0.45	0.10	-0.1	10.58	299.34	28.64
	0.80	0.30	0.20	0.2	7.20	290.19	19.49
nsfer	0.80	0.20	0.25	0.2	4.92	284.02	13.32
rease +	0.75	0.25	0.25	0.9	3.33	279.71	9.01
al	0.90	0.10	0.20	-1.2	6.97	289.57	18.87
ferential	0.90	0.20	0.20	-1.8	11.15	300.88	30.18

This option assumes for students, elderly, and handicapped, a $.25 reduced fare, with no transfer (new fare paid for each ride).

For all other options, the reduced (bus) fare is fixed so that a reduced fare with transfer is about half the price of an adult fare with transfer. (See printouts for details.)

The reduced fare rail drop for each option is half the adult rail drop (rounded down to the nearest nickel multiple where necessary), e.g., an adult cash drop of either $.25 or $.20 yields a reduced drop of $.10.

Under this option, $.20 is paid each time a transfer is used.

le 2 Ridership and Revenue Estimates of Selected Fare Structures (65% Transfer Rate)

	Adult Bus Fare	Adult Rail Drop	Transfer Price	% Change Ridership	% Change Revenue	Total Annual Revenue ($ M)	Annual Revenue Gain ($M)
nsfer	0.90	0	0.25	-1.8	7.08	289.86	19.16
crease	0.80*	0	0.40	-0.3	9.14	284.61	13.91
y	0.90	0	0.20**	-1.9	7.50	291.00	20.30
	0.80	0.30	0.10	0.1	5.93	286.75	16.05
dal	0.75	0.40	0.10	1.2	5.88	286.62	15.92
ferential	0.80	0.45	0.10	-0.8	12.51	304.56	33.86
	0.80	0.30	0.20	-1.0	10.54	299.23	28.53
nsfer	0.80	0.20	0.25	-1.2	8.90	294.79	24.09
crease	0.75	0.25	0.25	-0.7	7.64	291.38	20.68
dal	0.90	0.10	0.20	-2.0	9.30	295.87	25.17
ferential	0.90	0.20	0.20	-2.7	13.82	308.11	37.41

See Table 1.

See Table 1.

Date: September 23, 1985

To: Fares Policy Task Force

From: Darwin G. Stuart, Manager, Strategic Planning

Re: Related Service/Fare Issues

As mentioned in the minutes of the September 13 Task Force Meeting, Strategic Planning staff have identified several supplemental service/fare issues which should be considered in the implementation of a modified fare structure. This memo addresses information requirements concerning the following (miscellaneous) services and fares:

- express service (Evanston Express, Bus routes #2, 6, 14, 99, 99M, 147, 162, 164)
- local service (97-Skokie; 201, 202, 203, 204, Evanston and Evanston rail between South Boulevard and Linden Stations)
- shuttle service (bus routes #1, 7, 11, 20, 131, 44, 56, 60, 120, 121, 122, 123, 125, 126, 127, 128, 129, 146, 151, 156, 157)
- RTA Link-up Passes
- Evanston supertransfer (Saturday)
- Supertransfers (Sunday/holidays)
- Culture Bus supertransfer

Changing the rates associated with these services is not likely to significantly alter the revenue collected by the system. Therefore, pricing of these services needs to be viewed in light of potential tradeoffs and conflicts between fare policies, on one hand, and limited administrative and operating costs on the other.

Express Services. The rationale for express surcharges is twofold. By operating vehicles with limited stops, riders are receiving services whose travel times are significantly reduced—these are premium services. Express surcharges are also supported by the extra CTA expenses incurred in serving the local ridership travelling in the same corridors with other vehicles. The fare structure modifications discussed by the Task Force would not appear to conflict with the practice of collecting express surcharges. As a policy matter, in concert with pricing alternatives that increase rail fares, the Evanston Express surcharge might be increased from $.20 to $.25, with a relatively small gain in overall system revenue.

Local Services. Discounted local services in the suburbs are presumably maintained to capture a relatively large ridership group that would not ride at full CTA fare levels. The reason for such a market strategy could be revenue-based or in support of municipal goals to alleviate traffic and parking congestion. In either case, the underlying assumption about the effects of discounted local fares should be examined.

In particular, a question persists as to whether or not this kind of fare policy would be appropriate on certain bus routes in Chicago where riders also travel shorter average distances. Members of the Task Force suggested an examination of the elimination of local fares. This would presumably include the Evanston supertransfer.

Shuttle Services. Throughout CTA's history, there have been discounted downtown shuttle fares for riders normally paying full fare. As with local services, the discounts are presumably maintained to capture a relatively large ridership group that would not ride at full CTA fare levels. Along with potential relief of traffic and parking congestion, this fare policy is also designed to serve commuter rail riders with short distance travel needs and to make downtown business locations more readily accessible. The extent to which this fare policy supports its objectives is unclear. But, because administrative and operating costs associated with downtown shuttle fares are readily visible, there is strong support for a recommendation to eliminate shuttle fares, particularly given the image of the typical shuttle fare rider as an individual whose income exceeds that of CTA's average rider.

RTA Link-up Passes. The RTA Link-up Pass Program is specifically designed to assist in the promotion of the commuter rail system's monthly passes. Through surveys, more detailed information is available about the impact of this fare policy on CTA. Because both locations and times of Link-up Pass usage are restricted, and the CTA is compensated for foregone revenue, it is clear that CTA has not been hurt by this program to date. There is no reason to expect this to change so long as RTA's payments continue according to the existing formula. The key question on the Link-up Pass is whether its fate is or should be linked to the continuation of downtown shuttle fares.

[illegible]

Supertransfers. Supertransfers were initially implemented as a means to stimulate ridership and revenue during periods of time (weekends and holidays) when there is excess capacity on the system that cannot be reduced for other policy reasons. As the area's economy, regional development, and other ridership factors have changed, the pattern of excess capacity that would exist without supertransfers would differ. Although the fare structure modifications discussed by the Task Force would not directly conflict with the continued sale of supertransfers, it may be possible to further revenue and efficiency objectives by assessing at this time whether the supertransfers and Culture Bus supertransfers should continue to be sold (and if so, at what price).

DGS:NKH:df

Date: September 17, 1985

To: Ernest R. Sawyer, Deputy Executive Director, Planning & Development

From: Darwin G. Stuart, Manager, Strategic Planning

Re: Fare Policy Task Force Meeting
September 13, 1985

B. Baxa
A. Curtis
N. Hall
H. Hirsch
P. Kodowak
G. Millonas
D. Mitchell-Bey

W. Mooney
N. Nagel
M. Pollack
E. Rauch
D. Ryan
E. Sawyer
D. Stuart

The Fares Policy Task Force produced at this meeting a reduced list of two short range fare increase options for detailed analysis and recommendation. Task Force members also expressed individual and departmental perspectives on the merits of other promising options whose implementation requirements appear to surpass available technical and/or time resources for the next budget year.

The first option which efficiently raises additional farebox revenue with minimum implementation obstacles involves a simple increase in the price of a transfer by as much as $.15 or more. Higher transfer prices could be considered in conjunction with slightly discounted full and/or reduced fares. Impacts on multiple transfer transit users will be further analyzed.

The second option entails a rail/bus differential with a "rail drop" paid each time a patron enters the rail system. These surcharges would reflect rail's higher operating costs and generally higher level of service. Because rail trips tend to be much longer than bus trips, many transit users will see this pricing as more equitable than current flat fares.

Other encouraging options for consideration at a later time would involve a fare structure with peak/off peak differentials, as well as combinations of these approaches. Significantly, there was little support for further consideration of "no transfer" fare structure options as a solution for future budget shortfalls.

Further Fare Structuring Activities

Strategic Planning Staff will proceed with further fare increase analyses of the two selected options so that the Chicago Transit Board can be advised of the Task Force's findings in October. One set of activities concerns a refined analysis of ridership and revenue projections of each recommended option and combinations thereof. A second research effort will consist of the identification and study of the related service/fare issues which need to be considered because of their impacts on the implementation process. These issues include express surcharges, local fares (e.g. Evanston), and shuttle fares. The Fares Task Force and its members will be consulted to pinpoint the information necessary for resolution of any problems.

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[illegible]

[illegible]

[illegible]

Date: September 10, 1985

To: Darwin G. Stuart, Manager, Strategic Planning

From: Ethan C. Rauch, Strategic Planning Intern E Rauch

Re: Monthly Pass Prices for Promising Fare Options

Table I shows likely adult and reduced monthly pass prices for each of the "promising" fare options, assuming that CTA continues to offer only a single pass to each type of rider (adult and reduced). The first step in the calculations was to determine the average fare per trip under each option. This average was then divided by the current average fare (about 94 cents for adults and 44½ cents for reduced fare riders) and multiplied by the current pass price. Thus, if the new average fare per trip were 10 percent higher than the current average, there would also be a 10 percent increase in the pass price. Prices are rounded to the nearest half dollar.

TABLE I -- ADULT & REDUCED PASS PRICES

OPTION	ADULT PASS PRICE	REDUCED PASS PRICE
2c	$ 42.50	$ 18.00
4a	$ 42.50	$ 19.50
5c	$ 42.00	$ 17.50
6	$ 42.00	$ 19.00
10b	$ 44.50	$ 19.00
1b	$ 44.50	$ 20.00
4b	$ 45.00	$ 20.50
5d	$ 44.50	$ 19.00
9	$ 44.00	$ 21.50

For those promising options that have different peak and off-peak fares, Table II shows prices for two separate types of pass: one that is good at all times, and another that is good only during off-peak hours. The price of the universal pass is based on the average peak fare, while the price of the off-peak pass is based on the average off-peak fare.

TABLE II -- PEAK/OFF-PEAK PASS PRICES

OPTION	ADULT ALL TIMES	ADULT OFF-PEAK ONLY	REDUCED ALL TIMES	REDUCED OFF-PEAK ONLY
4a	$44.00	$40.00	$20.00	$18.00
9	$45.50	$41.50	$23.00	$19.00
10b	$50.00	$37.00	$21.50	$16.00

Table III gives the prices of systemwide and "bus only" passes for those options that have rail/bus differentials. The systemwide pass price is based on the average rail fare, while the bus pass price is based on the average bus fare.

TABLE III -- RAIL/BUS PASS PRICES

OPTION	ADULT SYSTEM-WIDE	ADULT BUS ONLY	REDUCED SYSTEM-WIDE	REDUCED BUS ONLY
5c	$51.50	$34.50	$23.00	$16.00
6	$45.00	$39.50	$22.00	$18.00
10b	$49.50	$40.50	$22.00	$18.00
5d	$50.00	$39.50	$22.50	$18.00
9	$49.50	$39.00	$25.00	$20.50

ECR:df

F

Date: September 9, 1985

To: Ernest R. Sawyer, Deputy Executive Director, Planning & Development

From: Darwin G. Stuart, Manager, Strategic Planning D G Stuart

Re: Fares Task Force Meeting
September 3, 1985

ATTENDEES:

B. Baxa	Public Affairs
A. Curtis	Human Resources
N. Hall	Strategic Planning
H. Hirsch	Operations Planning
M. Lavelle	Transportation
J. Lawrie	Budget
S. Miller	Financial Services
G. Millonas	Engineering & Maintenance
D. Perk	Finance
M. Pollack	Financial Services
E. Rauch	Strategic Planning
L. Ritter	Operations Planning
E. Sawyer	Planning & Development
D. Stuart	Strategic Planning
V. Wendorf	Financial Services

The purpose of the second Fares Policy Task Force meeting was 1) to present the estimated ridership and revenues associated with the fare structure options raised to date, and 2) to discuss the advantages and disadvantages relating to the major implementation issues that have been pointed out by Task Force members. As discussed with the Chief Administrative Officer, the analysis/evaluation timetable allows for another Fares Policy Task Force meeting on Friday September 13, 1985, at which time the Task Force is expected to identify two options for recommendation to the Chicago Transit Board. This meeting thus served as a forum where areas of disagreement or uncertainty could be identified for (hopefully) resolution by the next meeting.

Key Unsettled (unresolved) Implementation Issues

Through most of the meeting Task Force members gave individual and departmental perspectives concerning the following implementation issues:

- Conflicts between riders and employees on shifts between peak and non-peak periods
- Electronic farebox system modifications to automatically accommodate peak/off peak transitions
- Capability of multi-fare registers to handle differential fares
- Need for ticket agents to close/open during peak/off peak changes
- Effects of time differentiated fares on internal control and fare auditing process/procedures

- Simplicity and acceptability of future fare structures with respect to regular and less frequent riders.

In general, directly conflicting opinions on these implementation issues were often expressed. The Strategic Planning Department will coordinate additional research into these areas, with the objective of providing an accurate summary of the points of disagreement. Experience from other urban areas will also be cited, where appropriate. As an example, a supplementary analysis of the merits and implementation issues associated with various "no transfer" fare structure proposals is attached. Other follow-up material is also attached and will be handed out at the next meeting.

Looking Ahead

The next Fares Policy Task Force meeting is scheduled for Friday, September 13, 1985 at 9:30 AM, in the Board Room. This meeting will consist of presentation and discussion of the key unsettled implementation issues, followed by a selection/recommendation process where the Task Force is expected to endorse two fare structure proposals for consideration by the Chicago Transit Board.

Besides selection of two preferred alternate weekday cash fare structures, the Task Force may suggest policy recommendations on prepaid fare instruments, surcharges, discount fares and transfer privileges (in general terms).

Following the next Task Force meeting, staff members from various departments will need to work together to package the actions of the Task Force into a proposal for transmittal to the Board. The Board may choose to take some action on fares as early as their October or November session, with public hearings possibly scheduled for the next month.

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cc: Task Force Members

Attachments:
- Summary of Fare Increase Options
- Implementation Issues for Promising Fare Increase Options
- "No Transfer" Fare Structure Issues
- Elasticities for CTA Fare Structure Analysis
- Memo: Transfer Rates for Weekday Ridership
- Annual Revenue Estimates for Promising Fare Increase Options
- Experience of other Regions in Implementing Time-of-Day Fare Differentials

Annual Revenue Estimates for Promising Fare Increase Options

The following table shows rough estimates of the annual revenue that would be produced by implementation of the promising fare increase options. The budgeted revenue for fiscal year 1985 was used as a base. This figure, $270,699,000, includes both cash fares and pass revenue. Transportation revenue statistics through the seventh financial period indicate that this projection falls within .3% of actual performance.

These forecasts reflect the assumption that the percentage change in annual transportation revenue would be directly proportional to the weekday percentage change. Supporting this assumption are both the fact that revenue from our weekday services composes the lion's share of revenue and the logic that changes in Saturday and Sunday/Holiday traffic would parallel weekday traffic change.

OPTION	% CHANGE IN REVENUE	ESTIMATE OF ANNUAL REVENUE
2c. TRANSFER INCREASE	4.16%	$281,960,000
4a. PEAK/OFFPEAK DIFFERENTIAL	5.29	285,019,000
5c. MODAL DIFFERENTIAL WITH A RAIL "DROP"	4.53	282,962,000
6. MODAL TRANSFER DIFFERENTIAL WITH A RAIL SURCHARGE	4.16	281,960,000
10b. OFFPEAK: FLAT FARE; PEAK: MODAL DIFFERENTIAL WITH A RAIL "DROP"	10.34	298,689,000
1b. ACROSS THE BOARD INCREASE	8.10	292,626,000
4b. PEAK/OFFPEAK DIFFERENTIAL	10.50	299,122,000
5d. MODAL DIFFERENTIAL WITH A RAIL "DROP"	8.49	293,681,000
9. PEAK AND MODAL DIFFERENTIALS WITH RAIL SURCHARGE	9.51	296,442,000

SUMMARY OF FARE INCREASE OPTIONS

OPTION	BUS FARE	RAIL FARE	TRANSFER COST	RAIL "DROP"*	PEAK SUR-CHARGE	RIDERSHIP CHANGE	REVENUE CHANGE	REVENUE TO RIDERSHIP RATIO
THE MOST PROMISING OPTIONS:								
2c. TRANSFER INCREASE	.90	.90	.25			-0.8%	4.16%	-5.20
4a. PEAK/OFFPEAK DIFFERENTIAL	.90	.90	.10		.10	-1.0	5.29	-5.29
5c. MODAL DIFFERENTIAL WITH A RAIL "DROP"	.80	1.10	.10	.30		+0.6	4.53	7.55
6. MODAL TRANSFER DIFFERENTIAL WITH A RAIL SURCHARGE	.90	1.00	.20** .10***			-0.7	4.16	-5.94
10b. OFFPEAK: FLAT FARE; PEAK: MODAL DIFFERENTIAL WITH A RAIL "DROP"	.80 1.00	.80 1.30	.10 .10	 .30		-0.2	10.34	-51.7
OTHER PROMISING (BUT LESSER) OPTIONS:								
1b. ACROSS THE BOARD INCREASE	1.00	1.00	.10			-2.4	8.10	-3.38
4b. PEAK/OFFPEAK DIFFERENTIAL	.90	.90	.10		.20	-2.0	10.50	-5.25
5d. MODAL DIFFERENTIAL WITH A RAIL "DROP"	.90	1.10	.10	.20		-1.3	8.49	-6.53
9. PEAK AND MODAL DIFFERENTIALS WITH RAIL SURCHARGE	.80	1.20	.40** .20***		.10	-1.4	9.51	-6.79
OTHER OPTIONS:								
3a. NO TRANSFER	.50	.75				5.2	-12.30	-2.36
3c. NO TRANSFER	.75	1.00				-3.8	10.40	-2.74

* FOR ANY TRANSFERS TO RAIL
** BUS TO RAIL TRANSFER
*** ALL OTHER TRANSFERS

IMPLEMENTATION ISSUES FOR PROMISING FARE INCREASE OPTIONS

OPTION	OPERATING PROBLEMS	OTHER ISSUES
2c. Transfer Increase	Increased temptation and reward resulting from abuse, fraudulent use and illegal sales of transfers.	**EQUITY ISSUES:** Some riders who must transfer may feel discrimination. Financial burden not equally shared by riders.
4a. Peak/Off-Peak Differential	Passenger/Employee conflicts over peak/off-peak transitions will become a major issue. Other areas of concern are required farebox modifications, capacity of Multi-fare registers, increased complexity in the use of turnstyles, need for ticket agents to close and reopen, additional complexity of the fare auditing process, reinstruction of fare collecting employees, and lack of system-wide continuity.	**SIMPLICITY AND ACCEPTABILITY:** There may be negative reaction associated with transitions between peak and off peak periods. Three issues are involved: communicating when the scheduled transitions occur, displeasure with those scheduled transition points, and disagreement over the actual time. Public outcry may be expected. Some fare system complexity is added. **NON-CASH FARES:** Adds complexities to pass and token pricing: more types of passes? Peak and off-peak tokens? May involve increased administrative costs.
5c. Modal Differential with a Rail "Drop" 6. Modal Transfer Differential with a Rail Surcharge	Some areas of concern are possible programming of fareboxes for more fare types, capacity of multi-fare registers, re-instruction of fare collecting employees, lack of continuity between modes.	**NON-CASH FARES:** Adds complexity to pass and token pricing. More types of passes and tokens? Would transfers be restructured (bus-only versus unlimited transfers?) or would there be rail cash "drops"?

OPTION	OPERATING PROBLEMS	OTHER ISSUES
10b. Offpeak: Flat fare; Peak: Modal Differential with a Rail "Drop"	Areas of concern are: capacity of multi-fare registers, reinstruction of fare collecting employees, complications resulting from combining (fare differentiation methods).	**SIMPLICITY AND ACCEPTABILITY:** The more complex the fare system, the more rider confusion exists. **NON-CASH FARES:** Difficult to use simple prepaid fare devices such as passes, tokens in such a complex structure. Other issues associated with 4a and 5c also apply.

"No Transfer" Fare Structure Issues

As part of the Fares Policy Task Force analysis, Strategic Planning staff reviewed the report issued by the 1983 Fare Collection Task Force. A copy of a summary table from the report is attached.

The "No Transfer" proposal was not studied as a means to increase the farebox revenue (including revenue from pass sales). Instead, the impetus for the proposed fare structure change stemmed from 1) estimated cost savings resulting from the reduction of dollar bill handling, and 2) anticipated revenue increases due to the reduction of transfer and fare abuse. Updated revenue and ridership estimates of several "no transfer" structures were also included in the current Fare Policy Task Force work.

The accompanying table (from the earlier work) shows cost savings from $4.5 Million to $8.5 Million per year. However, it should now be realized that the ongoing implementation of electronic fareboxes should drastically reduce any cost savings that would be forecast for 1986. Estimates of the revenue recovery from reduced transfer abuse range from $3.2-$16.0 Million annually. However, the new transfer changes which CTA is about to enact are designed to eliminate much if not most of the present transfer fraud. Given that two of the objectives for a "No Transfer" fare structure—eliminating dollar-bill handling problems and transfer abuse--are already being solved, the final aspect of this fare structure to be analyzed reduces down to net farebox revenues gained or lost. IN BOTH THE 1983 AND PRESENT 1985 ANALYSES, A 50-75 (NO TRANSFER) FARE STRUCTURE WAS ESTIMATED TO LOSE SYSTEM REVENUE.

At a higher fare level, such as 75-100 (no transfer), the present analysis shows a potential for a net revenue gain, but only at the expense of significant ridership loss (nearly 4%) and very high fares ($2.25 - $3.00) for that 10% of system ridership which involves riding 3 vehicles (2 transfers). The remaining 35% of system patronage which transfer only once would be paying $1.50-$2.00 per trip, which might also be regarded by the public as exhorbitant. A significant switch to monthly passes was consequently assumed (but not all transfer bound patrons would be able to make such a switch).

The 1983 Fare Structure Experiment Report also included a Title VI Equity Impact Analysis which found that seven bus routes--3 minority and 4 non-minority--would be adversely impacted because most of their riders would require more than one vehicle change to complete a trip. The highest level of impact (most riders) was estimated to occur on the 3 minority routes. These impacts would be even more severe under a $.75-$1.00 fare structure.

CHICAGO TRANSIT AUTHORITY

NO TRANSFER FARE STRUCTURE

	1982			1983 (F)		
	Projection* #1		Projection* #2	Projection* #1		Projection* #2
are -50¢ Bus, 75¢ Rail, $40 Monthly Pass See Page 9						
Farebox Revenue Required (A)	$262.9		$262.9	$267.1		$267.1
Farebox Revenue Produced	246.8		241.5	257.4		251.9
Difference - Shortfall (E)	$ 16.1		$ 21.4	$ 9.7		$ 15.2
Additional Savings Revenues & Costs						
Cost Savings (B)	$4.5	to	$ 8.5	$4.5	to	$ 8.5
Additional Revenue (C)	3.2	to	16.0	3.2	to	16.0
Less Added Costs (D)	(1.9)	to	(2.8)	(1.9)	to	(2.8)
Total	$5.8	to	$21.7	$5.8	to	$21.7
are- 50¢ Bus, 65¢ Rail, $40 Monthly Pass see Page 11						
Farebox Revenue Required (A)	$262.9		$262.9	$267.1		$267.1
Farebox Revenue Produced	240.6		236.3	250.9		246.5
Difference - Shortfall (E)	$ 22.3		$ 26.6	$ 16.2		$ 20.6
Cost Savings & Additional Revenues						
Cost Savings (B)	$4.5	to	$ 8.5	$4.5	to	$ 8.5
Additional Revenue (C)	3.2	to	16.0	3.2	to	16.0
Less Added Costs (D)	(1.8)	to	(3.1)	(1.8)	to	(3.1)
Total	$5.9		$21.4	$5.9		$21.4
are- 60¢ Bus, 75¢ Rail, $40 Monthly Pass See Page 13						
Farebox Revenue Required (A)	$262.9		$262.9	$267.1		$267.1
Farebox Revenue Produced	256.0		247.4	267.0		258.0
Difference - Shortfall (E)	$ 6.9		$ 15.5	$ .1		$ 9.1
Cost Savings & Additional Revenues						
Cost Savings (B)	$4.5	to	$ 8.5	$4.5	to	$ 8.5
Additional Revenue (C)	3.2	to	16.0	3.2	to	16.0
Less Added Costs (D)	(2.8)	to	(4.2)	(2.8)	to	(4.2)
Total	$4.9	to	$20.3	$4.9	to	$20.3

*See Page 15 for Footnotes and Assumptions used as a basis for these projections.

(A) Actual for 1982
(B) Cost savings resulting from reduction of dollar bills
(C) Additional revenue attributable to reduction of transfer and fare abuse.
(D) Costs of increased monthly and/or biweekly pass sales.

} See Page 16

(E) Shortfall is the difference between revenue required and revenue produced.
(F) Farebox Revenue Produced for 1983 is based upon 1982 assumptions plus 4.3% which covers an extra week in CTA fiscal 1983 and increased ridership resulting from O'Hare Extension.

CHICAGO TRANSIT AUTHORITY

No Transfer Fare Structure
(In Millions)

Cost Savings

	Annualized Amounts	
	At 180,000 Bills Daily	At 300,000 Bills Daily
Bill Handling Costs	$1.7	$2.8
Farebox/Cashbox Costs	2.1	5.0
Transfer Printing and Distribution	.7	.7
	$4.5*	$8.5

*Chicago Police Department has been providing added security at vault islands at annual cost of approximately $500,000 which is not included above.

Additional Revenue

Recovery Fare and Transfer Abuse Estimated Range, 2% to 10% of Current Bus Cash Fares Each 1% = $1.6	3.2 to 16.0

Notes on Fare and Transfer Abuse

Operations Planning, in a memo dated 6-23-82, estimates transfer abuse at $.3 - 2.5 annual loss.

Internal Audit, in a memo dated 8-2-82, estimates farebox shortage at $2.0 - 4.6 annual loss.

Added Costs

Costs include printing, commission and distribution including additional CTA personnel in several departments to handle monthly and bi-weekly pass sales.

Estimated Range - each 100,000 increase in annual purchases = $100,000 additional expense	$1.8 to $4.2

Commission costs are included at 1% of sale price.
Each additional 1% commission paid for each additional 100,000 passes sold will increase costs by approximately $27,000.

cta

Date: September 6, 1985

To: Martin Pollack, Senior Financial Analyst

From: Darwin G. Stuart, Manager, Strategic Planning

Re: Transfer Rates for Weekday Ridership

As discussed, Strategic Planning Staff have reinvestigated our estimates of the percentage of weekday riders who purchase transfers. The source of our ridership data for this and our fares impact estimates is the Operations Planning Department's Trip Component Survey from May, 1983 (attached).

Shown below are the elements of the data that we used in our calculations. Our calculations centered on the cash fares paid, but the last column indicates the percentage of each type of trip compared to total weekday ridership (including monthly passes).

Transfer rate calculations per trip components

*B.R.T.	TYPE OF TRIP	WEEKDAY TRIPS (000) adult	reduced	total	% OF CASH RIDERS	% OF ALL RIDERS
1 0 1	bus	232	91	323	38.2	29.6
0 1 1	rail	143	22	165	19.5	15.1
	Total not using transfers	375	113	488	57.7	44.7
2 0 2	bus-bus	92	67	159	18.8	14.6
1 1 2	bus-rail	96	14	110	13.0	10.1
0 2 2	rail-rail	12	1	13	1.5	1.1
3 0 3	bus-bus-bus	9	6	15	1.7	1.3
2 1 3	bus-bus-rail	28	7	35	4.1	3.2
1 2 3	bus-rail-rail	11	1	12	1.4	1.1
4 0 4	bus-bus-bus-bus	1	0	1	.1	.0
3 1 4	bus-bus-bus-rail	2	0	2	.2	.1
2 2 4	bus-bus-rail-rail	8	2	10	1.1	.9
	Total using Transfers	259	98	357	41.9	32.4
	TOTAL	634	211	845	99.6	77.1

Two factors complicate the description of transfer rates, linked vs. unlinked trip accounting and monthly pass usage. Because the Operations Planning Survey addresses individual riders, the data we worked with is formatted entirely in terms of linked trips. Data from electronic fare boxes is in the form of unlinked trips and so must be adjusted to separate out transfers purchased and possible multiple transfer uses. Because pass sales have continued to increase, separate figures should be calculated to both include and exclude these riders.

DGS:NKH:df

Attachment

To begin our analysis of alternative fare structures, it was necessary to substantiate appropriate values for CTA system-wide fare elasticity and separate elasticities for the rail and bus systems. The most recent of these elasticity calculations were done by Michael Grovak of CTA after the major 1981 fare increases. Grovak used a mid-point elasticity formula comparing old and new ridership levels with old and new fare levels.

A check of his method and figures, explained in a memo written on October 22, 1982, is required to settle two issues: 1) possible differences in calculations using linked trips or unlinked trips and 2) the treatment of nested fare increases. Staff found that Grovak's results were consistent with the 1981 ridership date and the 1983 trip component survey data, and are approximately,equal to the point estimates we would recommend.

An examination of sample fare data showed that elasticities calculated by using unlinked trips and average fare per unlinked trip yields identical estimates as the associated inputs of linked trips and total fares.

The other issue that required analysis concerned the treatment of nested fare elasticity computations due to the existence of two fare increases within one year and the need to eliminate seasonal variations as a source of bias. The method shown in Grovak's memo appears to be based on intuition, but was corroborated by the results obtained when ridership and fare levels are adjusted using the first rail elasticity estimate (-.15) to negate the effects of the first fare increase.

This was done in two ways -- by calculations based on 1) the projected ridership levels had the first fare increase occurred before the second data point; and 2) the projected ridership levels had the first fare increase never occurred. As an alternative measure, it is consistent with economic theory regarding elasticities to treat the two separate fare increases as one to calibrate consumer responsiveness to price changes.

Each of the methods' results were consistent with the figures below, recommended for use during this project.

	Bus	Rail	System-wide
Elasticity	-.29	-.12	-.24

The system-wide elasticity estimate is a weighted average of the modal elasticities based on the relative number of unlinked trip components found in the May, 1983 Trip Component Survey.

To begin our analysis of [illegible] substantiate and update [illegible] separate elasticities for [illegible] these elasticity calculations [illegible] the major 1981 farm [illegible] formula [illegible] levels.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The following peak and off-peak elasticities were then derived to reflect literature findings that peak-hour travelers are half as sensitive to fare changes as off-peak travelers.

	Bus	Rail
Peak	-.20	-.08
Off-Peak	-.41	-.17

Remember, each of these elasticities represent the percentage change (decrease) in ridership to be expected for each 1.0% increase in fare. For example, a $.10 (11%) increase in peak hour bus fares will yield a 4.5% drop in peak-hour bus ridership.

Chicago Transit Authority

Operations Planning Department
Route & System Planning

TRIP COMPONENT SURVEY | OP-x84060
Results | 3/16/84
May, 1983

INTRODUCTION

In March, 1981, CTA undertook a survey of its Monthly Pass riders. In February, 1983, it was proposed that the March, 1981, CTA Monthly Pass ridership survey be updated. However, due to discussion of a proposal to change CTA's fare payment structure (by eliminating transfers and requiring payment upon each boarding of a vehicle), it was soon decided that a survey analyzing the modes used by all fare-paying riders to complete an entire trip was needed.

SURVEY IMPLEMENTATION

In May, 1983, a weekday sample interview survey was conducted throughout the CTA service area on board 31 randomly selected bus routes and at 8 randomly selected rapid transit stations.* Interviewers (comprised of student volunteers from the University of Illinois at Chicago and Route & System Planning staff) were instructed to choose respondents at random throughout their assigned periods. An interview survey format was chosen because we have found from past mailback surveys that it is very difficult to obtain from passengers accurate information on how they transfer from mode to mode; an interviewer can explain each question as it is asked, resulting in more complete survey responses. The average response rate was 60 surveys per bus route and 69 responses per rapid transit station. After the interviewer completed the survey, they asked the respondent to take a postage-paid postcard, fill in their names and addresses, and mail this back to CTA so that at a later date (probably after a fare change) we could ask them if their travel patterns had changed. A very satisfactory 28% of those surveyed returned postcards to us. copies of the survey and postcard are attached (Attachment I).

SURVEY RESULTS

The interviewers began the survey by recording the time of each interview and the rider's sex. Fifty-four and seven-tenths percent (54.7%) of the riders were female and 45.3% were male.

The survey was conducted from 0630 hours through 1900 hours. The following table shows a breakdown by time period of when riders were interviewed.

Time of day		Percent
A.M.	0630-1100 hrs.	25%
Midday	1100-1500 hrs.	17%
P.M.	1500-1900 hrs.	58%

---

*Proportionately fewer rapid transit stations were selected to compensate for the fact that it is much easier to interview riders waiting on a platform than to question passengers while on a bus; prior survey experience had shown us that when equal rapid transit stations were chosen, a disproportionate number of responses were received from rapid transit riders.

Survey Results (cont'd)

The morning and midday periods were somewhat underrrepresented due to manpower shortages which resulted from our rather heavy dependence on students; interviewers' assignments had to be made with class schedules in mind.

The main purpose of the Trip Component Survey was to discover how many modes (bus or rail) CTA riders use to make a complete one-way trip. Passengers were asked if the first vehicle boarded in the course of their current trip was a bus or train, and to name the route. Riders were then asked which mode and route was used next, until their entire one-way trip had been documented. The following table shows the results along with the percentages from OP-x82299, "Typical Weekday Trips, 1982, by trip components" which was based on 1981 Monthly Pass Survey results and quarterly bus counts. A new detailed breakdown of trip components by fare paid based on this survey is shown in Attachment II, OP-x84061.

Modes used*	1983 percentage	1982 percentage
Bus only	37.6%	30%
Rail only	18.1	15
Bus to bus	18.5	20
Rail to rail	1.6	1
Bus to rail	13.6	22
Bus to bus to bus	1.8	5
Bus to bus to rail	4.2	5
Bus to rail to rail	1.5	-
Bus to bus to bus to bus	.1	1
Bus to bus to bus to rail	.4	1
Bus to bus to rail to rail	1.4	-
Part of trip on RTA bus or commuter railroad	1.4	-

*Trip description does not specify order in which vehicles were taken.

We also asked riders what fare they paid for their trip. The results were:

Amount fare paid	Percentage
$ .90	16.3%
1.00	40.6
.40	7.6
.50	11.9
Monthly Pass	20.5
Other pass or permit	2.9

Of those surveyed, 20.5% use a Monthly Pass. (This figure is identical to the 1983 CTA 5th Period Operating Data Ridership Information Report which also indicates that 20.5% of total system unlinked trips were paid for with a Monthly Pass.) Of those who currently use a Monthly Pass, 85.8% say they purchase a pass regularly. When non-pass users were asked why they do not use a pass, the following responses were given:

Does not pay for me to use the Monthly Pass	47.0%
No special reason	28.2
Cannot afford a pass	14.3
Inconvenient to purchase a pass	6.1
Don't know where to purchase a pass	2.3
Fear loss or theft of the pass	2.0

It is interesting to note that if a per vehicle fare payment plan such as "50¢/75¢" was implemented, 75.8% of riders would experience no change in fares, or in fact, a fare decrease. Further, 27% of those who would be subjected to a fare increase already use a Monthly Pass.

MKF/DHR/smw
Attachments (2)

CHICAGO TRANSIT AUTHORITY	OP-x84061
Typical weekday trips (thousands), 1983 by trip components	3/20/84

(rounded to nearest 1,000 riders)

Type of trip[1]	Adult cash	Reduced cash	Monthly pass	Total	Percent of total
bus	232	91	91	414	37.5%
rail	143	22	34	199	18.0
bus-bus	92	67	45	204	18.5
bus-rail	96	14	41	151	13.7
rail-rail	12	1	5	18	1.6
bus-bus-bus	9	6	5	20	1.8
bus-bus-rail	28	7	11	46	4.2
bus-rail-rail ...	11	1	5	17	1.5
bus-bus-bus-bus .	1	-	-	1	.1
bus-bus-bus-rail	2	-	2	4	.4
bus-bus-rail-rail	8	2	5	15	1.4
RTA bus or rail[2]	8	2	5	15	1.4
TOTAL	642	213	249	1,104	100.0%

(-) indicates less than 1,000 on a typical weekday

[1] Trip description does not specify order in which vehicles were taken.

[2] Indicated both RTA and CTA vehicles are used.

SOURCE: 1983 CTA Trip Component Survey

MKF/smw

Supersedes OP-x82299

SERIAL NO. ____________

CTA TRIP COMPONENT SURVEY

SATURDAY AND SUNDAY

1. ☐ 1 ☐ 2.

2. ☐ 1. ☐ 2. ☐ 3.

3. ROUTE: ____________

4. TIME: ____________

5. WHAT IS THE PURPOSE OF THIS TRIP?

☐ 1. Work	☐ 5. Medical
☐ 2. Education	☐ 6. Home
☐ 3. Shopping	☐ 7. Worship
☐ 4. Recreation	☐ 8. Other

6. WHERE DID YOU BEGIN THIS TRIP?

____

(main cross-streets) 1 2 3 4 5

7. WHERE WILL YOU END THIS TRIP?

____

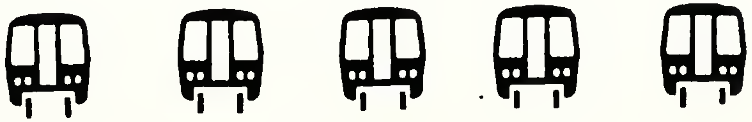
(main cross-streets) 1 2 3 4 5

8. HOW DO YOU USUALLY MAKE THIS TRIP?
DO YOU HAVE TO TRANSFER TO COMPLETE THIS TRIP?

BUS

Rte ______ ______ ______ ______ ______

RAIL



Sta ______ ______ ______ ______ ______

9. IS THIS TRIP A:

☐ 1. Round trip? (Trip will be repeated today.)
☐ 2. One-way trip? (Same trip will not be repeated today.)

9a. HOW FREQUENTLY DO YOU MAKE WEEKEND TRIPS ON CTA?

☐ 1. 4 weekends per month
☐ 2. 2-3 weekends per month
☐ 3. Once a month or less

10. WHAT TYPE OF FARE DID YOU PAY?

☐ 1. Full cash fare 90¢
☐ 2. Full cash fare - downtown shuttle 60¢
☐ 3. Full cash fare with transfer $1.00
☐ 4. Reduced fare (incl. elderly, handicapped ID)
☐ 5. Reduced fare with transfer 50¢
☐ 6. CTA Monthly Pass
☐ 7. Other pass or permit
☐ 8. SUPERTRANSFER $1.40

10a. IF CASH FARE WAS PAID, DID YOU USE A:

DOLLAR BILL?		TOKEN?	
☐ 1. Yes	☐ 2. No	☐ 3. Yes	☐ 4. No

11. IF RESPONDENT PAID REGULAR FARE:

WHY DON'T YOU CURRENTLY BUY A MONTHLY PASS?
(only check one answer, try not to prompt)

☐ 1. Inconvenient to purchase
☐ 2. Don't know where to buy one
☐ 3. Can't afford it
☐ 4. Don't use CTA enough to buy one
☐ 5. Afraid of losing it or it being stolen
☐ 6. Too expensive
☐ 7. Other

12. IF RESPONDENT USED CTA MONTHLY PASS:

DO YOU REGULARLY BUY A CTA MONTHLY PASS?

☐ 1. Yes ☐ 2. No

COMMENTS: ____________

____

Thank you.

Interviewer ID no. ____________

CTA RIDER SURVEY

Dear Rider:

Thank you for answering our survey today. In a few months the CTA will do a follow-up survey to see if our passengers' public transportation needs have changed. Your response will be helpful in evaluating and improving our services. Please complete the following questions and either give the postcard to the interviewer or drop it in the nearest mailbox - - NO POSTAGE NECESSARY.

Please help us to help you!

NAME: ____________________

ADDRESS: ____________________

CITY: ____________________ ZIP: __________

cta 358.00 (05/83) (back)

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 11103 CHICAGO, ILLINOIS

POSTAGE WILL BE PAID BY

CHICAGO TRANSIT AUTHORITY
OPERATIONS PLANNING — Room 700
MERCHANDISE MART PLAZA
P. O. BOX 3555
CHICAGO, ILLINOIS 60654

Evidence on Time-of-Day Pricing in the United States

Volume 1: Final Report
May 1984

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16. Abstract

This report examines the evidence on time-of-day transit pricing in the U.S., particularly in terms of ridership, fiscal, and equity impacts as well as with respect to various implementation issues. Thirty-two time-of-day transit fare programs have been initiated in the U.S. since the early 1970, of which twenty-two currently exist. These are about evenly split between off-peak discounts, peak-period surcharges, and programs involving differential rates of fare increases between peak and off-peak periods. Most fare differentials have been fairly modest to date (i.e., around 10-15¢), though there have been several cases where peak charges exceed off-peak ones by 35¢. Regarding the duration of the designated peak period, the most common time span chosen was 6 hours. From interviews and site visits, it was also found that the most prevalent reason for adopting time-of-day pricing was to encourage ridership shifts to the off-peak. Unfortunately, however, there was little empirical evidence to suggest that time-of-day fare programs to date have accomplish just that, although in most cases the proportion of total ridership during off-peak periods rose. Statistical analysis revealed off-peak users to be more sensitive to fare changes than their peak period counterparts, with midday discount programs demonstrating the most prolific ridership impacts. Before-and-after analysis generally showed that the time-of-day fare programs had fairly inconsequential effects on farebox recovery, operating performance, or the composition of ridership, ostensibly due to the nominal size of most differentials. The most successful programs were those which collect fares on the basis of run direction (rather than exact time) and which aggressively marketed their programs.

17. Key Words
Time-of-Day
Ridership Impacts
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Implementation and Political Issues

Making time-of-day pricing work, both logistically and politically, is a major hurdle to overcome in the minds of many. Several important strategies which facilitated the implementation of time-of-day pricing deserve special attention. Foremost are some of creative ways devised for coping with the "boundary problem" -- i.e., collecting fares at the changeover point from the off-peak to peak period and vice-versa. Nearly one-third of all properties collect their differentials on the basis of individual bus runs or arrival at a major activity center rather than according to the specific hands on the clock. Run-based collection virtually eliminates fare disputes, more closely approximates cost variations, and provides the flexibility needed to make differential pricing manageable. In instances where run-based collection is used, individual bus schedules were shaded or printed in bold-face lettering to highlight exactly where, rather than when, fare rates would change.

Special signage was also used to facilitate the fare collection process. Moreover, coinage was chosen in Columbus (25 cents) and Denver (35 cents token) to reduce change handling in order to expedite the boarding process during high-volume midday hours. In addition, in almost every case studied, drivers were encouraged to exercise discretion when collecting differentials. Although there was some indication of fare evasion in several areas following the introduction of time-of-day pricing, overall there seemed to be a collective spirit of cooperation among users and drivers in enforcing the fare programs.

Another important aspect of implementing time-of-day pricing is the general receptiveness of different groups and special interests to the fare reform. From interviews and site visits, numerous individuals were polled regarding their reactions as well as the reactions of others to the fare changes. In general, most groups seemed fairly indifferent toward time-of-day pricing. Interviews with transit managers indicated that board members of over three-quarters of all areas were supportive of time-of-day pricing, considering it a more "business-like" practice. In areas where board members were initially skeptical, apprehensions tended to wane within several months of implementation. Interviews with drivers revealed that complaints over fare collection were generally related more to matters such as exact payment, multiple passes, and zonal charges rather than the time-of-day differential. In fact, some found time-of-day pricing to be a simplification of previous fare practices. No instances were found whereby drivers used the differential program and its greater likelihood for fare disputes as a bargaining chip during wage negotiations. Moreover, a national survey of transit managers conducted as part of this research found a resounding base of support for time-of-day pricing, boding well for its future.

Although there were scattered incidences of user complaints immediately following the introduction of peak surcharges in several areas, acceptance generally came quickly. Aggressive marketing and educational

programs certainly had something to do with this. However, the fact that differential pricing was already institutionalized in several areas and that time-of-day fares were actually simplifications of earlier fare practices in others also worked in their favor. Moreover, in that the vast majority of users ended up paying the same fare regularly, the differential itself became a non-issue. There were very few instances of peak period customers complaining about unfair treatment. Apparently, the adoption of fairly small differentials helped to assuage any potential ill-feelings. A number of transit managers interviewed volunteered that a small differential was consciously chosen initially to guard against alienating any one group, though with the intention of eventually widening it. As mentioned previously, few properties have actually increased their differential over time, however.

Perhaps the most vocal user protests were over the specific designation of the peak time bands rather than the fare rates themselves. In Denver, Washington, and several other areas, users outwardly complained at public hearings that the designated peak hours were too long, thus limiting their abilities to take advantage of lower fares. Although longer peak hours enhance revenues and perhaps reduce the incidence of fare disputes, the discouragement of shifting is perceived by many to be a major drawback. Finally, there were a few instances where certain groups of users were intimidated by the fare differentials. In Orange County, for instance, bus drivers have reported a high incidence of over-payment during off-peak periods among non-English-speaking patrons, primarily southeast Asians and Latinos, who simply don't understand the differential and are fearful of being accused of cheating.

The general public receptiveness to time-of-day pricing was unquestionably due, in large part, to effective marketing and user informational campaigns. Many systems launched aggressive promotional campaigns using extensive media coverage, newspaper advertisements, radio announcements, on-vehicle brochures, educational films, and areawide posters to inform the public about time-of-day pricing. A particularly useful marketing ploy adopted by a number of properties was to sell the fare program to the public as a discount fare rather than a peak surcharge, regardless whether it was or not. Most off-peak discounts were marketed as "bargain" and "incentive" fares, rather than peak/off-peak differentials. This tended to cast each program in a positive light and also avoided any hint of discriminatory pricing between peak and off-peak users. In the cases of peak surcharge and differential increase programs, the marketing tactic usually chosen was to emphasize the benefits of off-peak travel rather than the higher cost of peak period usage. These marketing strategies parallel those currently being used by many oil companies whereby emphasis is placed on receiving "cash discounts" rather than any mention of "credit card surcharges".

Date: July 26, 1985

To: Darwin G. Stuart, Chairman, Task Force for Fare Policies Analysis

From: Ethan Rauch, Strategic Planning Intern E. Rauch

Re: Review of CTA Fare Structures, 1970-1984

The first part of this report discusses the history and development of the CTA fare structure. Each element of the structure (e.g., the basic fare, transfers) is discussed as a separate category.

Following a brief section on experimental fares, the second part of the report discusses the many past proposals for changing the fare structure (except for a few that are mentioned earlier under the appropriate category). Readers are referred to Fares Bulletin OP-y82140 for a complete chronology of all fare changes since 1947, and to multiple and varied Operations Planning files for documentation of various fare proposals.

Basic Fare

Over the past 30 years or more, CTA has applied a single, flat fare to both buses and rapid transit, although surcharges were imposed on some suburban service for many years. The fare has, of course, been subject to periodic increases; the current 90-cent fare has been in effect since July 1981. Full-fare tokens, which had previously been offered for several years during the 1950's, were reintroduced on November 3, 1969, the date when CTA began requiring payment of exact fare on buses. Since the tokens were intended primarily as a convenience to riders, they were not discounted until October 1981, when CTA began selling tokens only in packages of 10 for $8.50. This discount was offered in an attempt to discourage the use of dollar bills.

Reduced Fare

Since its inception the CTA has offered a reduced fare to selected categories of riders. While the price has always been fixed at approximately half the full fare, the groups of riders eligible for the discount have changed over the years. It appears that at one time this fare applied only to children under 12. Students became eligible (only during certain hours) in 1956; senior citizens were made eligible during certain hours in 1969 and at all times in 1972; and handicapped riders of any age were included in December 1975. CTA had to adjust its reduced fares in 1975 in response to the federal requirement that all elderly and disabled riders be charged no more than half the corresponding adult fare during off-peak hours. This may have been the reason for implementing a special reduced transfer charge of 5 cents in December 1975; all riders had to pay the full price up to that time. The special transfer was eliminated in 1981 when the full and reduced fares increased to 90 cents and 40 cents. The current reduced fare with transfer is now exactly half the adult fare with transfer, in compliance with the federal rules.

In recent years CTA planners have considered a number of changes in senior and handicapped fare policies. An October 1982 Operations Planning memo discussed the ridership and revenue implications of: (1) allowing two hours of unlimited riding (instead of one hour) between 9:00 and 3:00 on weekdays, (2) selling a special midday monthly pass for reduced fare riders, and (3) eliminating the senior/handicapped discount during peak hours. All of these options may be construed as attempts to shift riders from peak to off-peak hours, and the last was expected to result in an annual revenue gain of $2.7 million as well. Needless to say, option 3 elicited considerable protest from working elderly riders, and it was never implemented. Option 2 also fell by the wayside, but the two-hour midday transfer was adopted in January 1983.

Transfers

Since the CTA "grid" service network requires many riders to transfer, the fare structure has traditionally included a relatively small transfer charge. Transfers were free until 1961 when a 5 cent charge was imposed; the fee was raised to 10 cents with the fare increase of 1970. While the base fare has doubled since then, the transfer charge has not changed. Transfers allow continuous travel in one general direction, with a specified amount of time allowed to traverse each zone.

A major liberalization of transfer regulations took effect in January 1974, when transfers became valid for unlimited riding within one hour of the time of issue. Time stamping of transfers at rapid transit station exits was also discontinued. In the spring of 1974, at a time when a number of reduced fare options were being discussed, there was talk of extending the unlimited riding privilege to two or three hours, but this was never done. Because of concern over fraud and abuse due to the current liberal transfer policies, the CTA is now considering a proposal to limit each transfer to two uses (three vehicles) with no stopovers, backtracking or round-trips permitted on a single transfer. More radical proposals to abolish transfers or substantially raise the transfer charge are discussed later in this report.

Monthly Passes

The unlimited use monthly pass is a relatively recent development at CTA, although a weekly pass had been tried in the 1950's. A 1970 "fare studies" memo rejected the monthly pass, predicting that it would lead to an increase in operating costs with a reduction in revenue, and that few people would purchase the pass. The first passes were not sold until early 1978, when the American Hospital Supply Corporation specifically requested a monthly pass as an inducement to its employees to use transit. While the pass subsequently spread to other employers, it was not offered directly to riders until November 1979. Since then it has become an integral part of the CTA fare structure, with both a reduced fare senior/handicapped pass and an Evanston/Skokie local pass instituted in March 1981. Proposals for off-peak monthly passes have also surfaced in the past.

In recent years CTA has conducted several monthly pass surveys, and in 1982 Operations Planning produced memos analyzing the induced travel and foregone revenue due to monthly passes.

Sunday Supertransfers (Day Passes)

The unlimited ride Sunday and holiday pass was the major permanent legacy of the 1974 Pass and Fare Task Force (discussed in more detail below). It followed by three months the introduction of a reduced Sunday bargain fair which was eliminated in 1981. On the recommendation of the Task Force, the supertransfer was implemented as a one-month experiment in June 1974, and subsequently extended through the summer and then for the rest of the year. The supertransfer was retained on the basis of a favorable evaluation which reported a 19 percent gain in Sunday ridership, together with a drop in revenue that was smaller than the decline that had occurred before the supertransfer was offered. The success of the supertransfer led to proposals for an Evanston Saturday supertransfer, which was soon adopted and remains in effect, and system-wide Saturday or weekend unlimited-use passes to increase ridership. The latter proposals were never tried, even experimentally. At about the same time the Task Force generated a memo proposing a "cultural bus" between Chicago tourist attractions. This proposal was not actually implemented until 1977.

Zone Fares and Express Surcharges

While CTA has historically maintained a flat fare within the City of Chicago, a surcharge was imposed for many years on certain through routes between the city and the northern and western suburbs. This surchage ranged from 10 to 20 cents between 1954 and its elimination in 1978. In addition, premium fares were charged for Evanston rapid transit until 1973, for the Skokie Swift until 1978, and for bus routes 17 and 97 until 1976 and 1974 respectively. A major impetus toward the elimination of suburban surcharges came in the mid-1970's with the establishment of the RTA and its desire for a simple, uniform fare structure for the entire Chicago region. The 1974 Pass and Fare Task Force recommended the reduction of north and west suburban surcharges largely for reasons of equity, since many riders traveled equally long distances within the City of Chicago but paid no surcharge. On January 1, 1978, all of the remaining suburban surcharges were abolished, as the RTA agreed to compensate CTA for the resulting losses. This action completed the simplification of the fare structure which was begun in the fall of 1976, when the RTA implemented a uniform flat fare structure and adopted a "universal transfer" valid on virtually all transit service within the RTA region. Again, RTA reimbursed CTA for the revenue foregone from the acceptance of the universal transfer.

While the suburban surcharges are gone, CTA has charged extra for the Evanston Express train and for certain express buses since 1981. The most important recent change occurred in January 1982, when CTA began collecting the express bus surcharges only on outbound trips from downtown Chicago. This was done in order to simplify fare collection and to allow people to ride these routes locally in outlying areas without paying the surcharge.

Downtown Shuttles and the Link-up-Pass

Since 1952 CTA has offered reduced "shuttle" fares during peak hours on certain bus routes operating to and from commuter rail stations within downtown Chicago. In a further attempt to integrate RTA commuter rail service with CTA buses in the Loop, the RTA Link-Up Pass was introduced an a nine-month experiment in April 1984. The pass is available only to rail commuters at $25 per month; it allows holders of monthly rail tickets to ride for no additional charge during peak periods on downtown shuttle routes as well as on all CTA bus routes running to and from suburban commuter rail stations. The RTA compensates CTA for the estimated revenue foregone due to acceptance of the pass. On the basis of preliminary evaluations, including a survey of November 1984 Link-Up-Pass purchasers, the program was subsequently extended through June 1985 and is still in effect. The Link-Up Pass was offered by mail for the first time (along with the rail tickets themselves) in September 1984.

Recent Fare-Related Experiments

The CTA has implemented a number of temporary experimental fares, but unfortunately few of these seem to be well documented in the files. A March 1970 "Fare Studies" memo notes that CTA has "tested" reduced fare downtown area passes, "bargain Tuesdays", reduced fare return tickets, and a surcharge for rapid transit, but no details are given. During the 1970's several free fare experiments were actually implemented, including free rides on State Street buses during the 1971 Christmas shopping season, a one-hour fare-free period in May 1977 in honor on National Transportation Day, and a free fare for Evanston local rapid transit riders for three weeks in June 1973. Between 1973 and 1975 a special "L'ephant" bus to the Lincoln Park Zoo was offered at a reduced fare of 10 cents. The only temporary promotional fare that seems to have been studied in much detail is the "Bus Shop" midday reduced fare experiment on the #49A and 95 South Side bus routes. Between June and September of 1973, persons boarding these routes on weekdays between 9:00 a.m. and 3:00 p.m. received a free return check valid anytime the same day. Despite the modest scope of this experiment, an Operations Planning report concluded that it "had little chance of success in either generating additional ridership or producing useful research data," as the plan was "extremely complicated and nearly impossible to market effectively". The report does recommend conducting "similar experiments under more controlled circumstances" as an aid in formulating an off-peak fare policy.

Proposals for Changes in the Fare Structure

In addition to actual changes and experiments, a variety of proposals to modify the CTA fare structure have been made over the past fifteen years. These proposals from within the CTA have run the gamut from minor alterations to complete overhauls of the fare structure, and from large fare reductions to significant revenue enhancement measures. Some of these proposals are better documented than others; sometimes the reasons behind the proposals are not clear. While many proposals include "quickie" estimates of ridership and revenue impacts, no serious or in-depth studies of the likely consequences of these changes were generally performed. The recent 50/75/No Transfer proposal, which perhaps came the closest to actual implementation, is

a major exception. It also is not clear from the files exactly what happened to some of these proposals or how seriously they were considered; we know only that they were not adopted.

In the early 1970's, a time of rising federal mass transit subsidies and concern over energy shortages, many proposals focused on selective fare reductions as an attempt to increase ridership, especially during off-peak hours. A 1971 proposal to establish a fare-free zone in the Loop elicited support from CTA Chairman Michael Cafferty and received considerable attention in the local press. Three years later a Pass and Fare Task Force (already mentioned above) discussed a variety of other ridership promoting fare options in addition to the Sunday supertransfer, which was adopted at that time, and the elimination of suburban surcharges, which was implemented a few years later. These proposals included the sale of tokens at a 50 percent discount, an off-peak fare reduction from 45 to 25 cents, extension of Sunday discounts to the period between 7:00 p.m. and 5:00 a.m. daily, a further liberalization of transfer rules, and the reduction and extension of downtown shuttle fares. These options were deferred pending further study, but there seemed to be a willingness to try new fare reduction experiments if the money could be found to subsidize them. The Task Force also looked at several pass options, including special midday, off-peak or weekend passes.

Around 1980, as financial difficulties forced CTA to raise fares from 50 to 90 cents within less than two years, the emphasis shifted to finding ways to gain more revenue without inducing the large ridership losses that another across-the-board fare increase would entail. A December 1980 memo by R. L. Vance and P. O'Brien of Operations Planning discussed several options for dealing with the financial crisis, including premium charges for long distances, express services, and rapid transit; time of day or day of week differentials; increases in shuttle fares or Evanston/Skokie local fares; and increases in transfer charges. (One proposed change--the elimination of free downtown L-subway transfers--was subsequently adopted).

During 1981 Michael Grovak, the Superintendent of Service Analysis and Research, carried this approach further by analyzing the price elasticities of different groups of transit users and advocating a "market pricing" strategy in order to gain revenue with a minimal loss in ridership. This market pricing approach, as outlined in a long Fare Policy memo of June 1981, revolves around the consideration of various strategies for extracting more revenue from those riders who would be willing to pay more. The memo discusses a peak/off peak differential, a Central Business District (CBD) surcharge, an express premium fare (which was soon implemented), increased transfer charges, elimination of reduced shuttle fares, elimination of reduced senior/handicapped fares during peak hours, and reinstatement of a suburban surcharge. Although estimates of the increased revenue from each option were provided, no specific recommendations were included in the memo.

Grovak followed up this memo in July 1981 with an analysis of market segment elasticities, and in December another memo discussed the revenue and ridership implications of a peak period surcharge as well as a rail system surcharge to reflect its longer travel distances and faster service. More detailed analyses of the proposed suburban charge appeared at about the same time. Grovak continued to advocate innovative, market-pricing approaches.

Much of this activity culminated in the spring of 1982, when public hearings were held to discuss ten fare options, many of which had been proposed in earlier memos by Grovak. These alternatives included a suburban "thru-fare" surcharge; zone fares for rail only (to be collected at certain suburban stations); suburban local fare parity with Chicago fares; a downtown shuttle fare hike; a rail surcharge; an increase in the transfer charge; a bus-rail transfer surcharge; a peak surcharge or an Owl/A. M. rush surcharge; and a downtown service surcharge on weekdays only. Of course many of these proposals elicited negative reactions at the hearings. Still other proposals were circulating among CTA staff at about the same time, such as a systemwide zone fare structure for both bus and rail. Some modest analytic work on these options was done at the time, including a "zone fare finance analysis".

Much of this debate was soon overshadowed by the problem of what to do about fare payment with dollar bills, which became a major headache for CTA after the 1981 fare increases. During that year two CTA Board Members, Messrs. Ruggiero and Griffin, put forward slightly different proposals to deal with the crisis by modifying the fare structure. Ruggiero suggested the reduction of the base fare to 50 cents and the elimination of transfers; Griffin proposed a 50 cent base fare and a 25 cent transfer surcharge together with the elimination of the monthly pass and free rides for CTA employees. In addition to performing an in-house revenue analysis of eight variations of these proposals, The City of Chicago hired consulting firm of Booz Allen to carry out a fare structure analysis. The Booz Allen study found that the Ruggiero plan would result in an annual revenue loss of almost $30 million; it recommended a discounted token plan as an alternative way of discouraging the use of dollar bills. The report also examined a suburban fare (or subsidy) differential on the ground that the suburbs were not paying their fair share, but concluded that more data was required in order to make a decision on this issue.

Despite the introduction of discounted tokens in 1981, the use of dollar bills continued unabated. In June 1982 Grovak produced still another memo that discussed a proposal for a 50 cent base fare, with no transfers and a 10 cent surcharge for both rail and express bus. By 1983 CTA staff were seriously considering several radical revisions of the CTA fare structure in order to deal with the dollar bill crisis. The first, and the most widely discussed and analyzed, was a proposal to charge 50 cents for bus and 75 cents for rail, with transfers eliminated. This idea provoked vigorous public opposition, primarily because of the perceived inequity of the financial burden imposed on those riders who need to use several vehicles. Partly because of arguments that this policy would discriminate against low-income and minority groups, CTA did a detailed analysis in an attempt to determine how many people make various types of multi-vehicle trips, who they are, and how much they would be hurt by the no-transfer policy. The ridership and revenue impacts of this policy were also estimated.

In view of the many objections coming from both the public and some CTA analysts, at least two alternative proposals were also explored. One alternative, the "prepayment incentive structure", would have encouraged the use of passes and tokens by imposing a substantial penalty for cash payment, similar to that currently imposed by the commuter railroads. Both this option and the 50/75/No Transfer proposal were analyzed in a detailed "Fare Structure Experiment Report" prepared by the Fare Collection Task Force in April 1983.

The second alternative was a somewhat more complicated fare structure proposed by Jordan Hillman of the CTA Board. This alternative entailed not only a price differential between bus and rail, but also a peak/off-peak differential; while it retained transfers, it imposed a substantial charge (20 cents or more) for each use of a transfer as well as a small charge on issuance of the transfer. While several versions of this alternative were analyzed by CTA staff, it was never as thoroughly studied or as seriously considered as the 50/75/No Transfer proposal. Although there may have been numerous reasons why the proposal was not adopted, the disapproval of the RTA, as expressed in a memo of May 1983, was probably one of the major ones. The RTA Fare Committee expressed concern about both the subversion of the unified regional fare structure, with its "universal transfer", and the potential for a decline in CTA revenue.

It should be clear from this cursory discussion that a great many different fare options have been considered by CTA staff over the years; in fact, nearly every imaginable type of fare structure has at least been suggested at one time or another. Few of these ideas have actually been tried experimentally in Chicago, however, and there seems to have been little exploration of the experience of other cities with various fare structures. In order to make intelligent decisions on future proposals for fare policy changes, CTA needs to examine what others have learned as well as its own limited experience with fare changes in Chicago. CTA could also benefit from a more complete and better organized documentation of its own fare-related analysis and planning activities.

cc: Task Force Members

cta

Date: August 27, 1985

To: Fares Task Force

From: Ernest R. Sawyer, Deputy Executive Director, Planning & Development

Ernest R. Sawyer

Re: Material for next Task Force Meeting

Attached are three items for discussion at the next task force meeting. These include:

1. A table of estimated revenue and ridership impacts of tested fare structures;
2. A summary of advantages and disadvantages associated with major fare structure changes; and
3. Copies of detailed computer results showing revenue and ridership impacts.

A memo prepared by Strategic Planning staff explaining these attachments is included.

PLEASE NOTE THAT OUR NEXT TASK FORCE MEETING IS TUESDAY, SEPTEMBER 3, 1985, NOT SEPTEMBER 30, AT 9:30 AM.

ERS:DGS:df

Attachments

Date: August 28, 1985

To: Darwin G. Stuart, Manager, Strategic Planning

From: Ethan Rauch, Strategic Planning Intern
Norman K. Hall, Systems Development Coordinator

Re: Fares Task Force Handouts

As discussed, three products have been prepared for use at the next Fares Task Force Meeting. These are: 1) a table of the estimated revenue/ridership impacts of the fare structures analyzed; 2) the compiled list of advantages and disadvantages taken from the Task Force worksheet responses; and 3) copies of the computer printouts showing in detail the estimated revenue and ridership changes.

1. Table of Estimated Ridership and Revenue Impacts

The first column lists a number of basic fare structures that have been mentioned as short-run alternatives for generating additional revenue. They appear roughly in order of increasing complexity. The first four options are: an across-the-board increase in the current 90 cent fare, an increase in the price of a transfer, the abolishment of transfers, and the imposition of a surcharge for travel in the peak periods. The remaining options involve charging a higher fare for rail than for bus travel, either by requiring a cash "drop" for each entry into the rail system, or by imposing a surcharge for each trip that involves one or more rail links. The latter scheme requires at least two different transfers to be issued on buses; one transfer is valid only on buses, while the other is good on both modes and adds the rail surcharge to the basic transfer price.

Recognizing the concern that could be raised by riders paying reduced fares, we have included a variation where there are separate full and reduced transfers. The last option analyzes a combined modal differential with a peak surcharge. To get a better picture of the revenue-generating potential of the fare structures, we tested multiple fare levels.

The "fare component" columns give the bus fare, rail fare, uniform transfer price (for structures with only one type of transfer), "rail drop", peak surcharge, and differential transfer prices (for those structures requiring more than one type of transfer).

The last three columns summarize the estimated ridership and revenue impacts for each fare structure and fare level tested. All figures refer to weekday cash-paying riders. The first of these columns gives the percentage change in ridership while the second shows the percentage change in revenue. The percent change in revenue divided

by the percent change in ridership yields the "revenue to ridership" ratio. This figure is reported in the last column. In general (but not always), this number is negative, reflecting the common sense notion that some ridership must be sacrificed in order to gain revenue. Thus, a large negative number is a better result than a small one, since it means that a great deal of revenue can be gained with only a small loss of ridership. A positive number is better still, since it indicates that both revenue and ridership can be gained at the same time. Of course, this all applies only to those options that increase revenue; any scheme that loses revenue should clearly be avoided.

The impacts of the "no transfer" (Option 3) fare structure needed to be modified to reflect heavy shifts to pass sales that would accompany its implementation. These shifts would be expected from riders whose trips require frequent transfers. The results were modified using the first method explained on page 15 of the 1983 Fare Structure Experiment Report (attached). Because of the strong economic incentive for many riders to shift to passes, the percentage of revenue gained is significantly reduced. The original (uncorrected) "no tranfer" estimates, are marked with an asterisk. The modified figures appear immediately below each original estimate.

In view of the large size of the estimated revenue gain as well as the favorable "revenue to ridership" ratio, certain specific alternatives are suggested for more detailed analysis. These alternatives are 2c, 4a, 5c, 6, and 10b. The analysis would entail further investigation of the advantages and disadvantages noted by Task Force Members.

2. Summary of Advantages and Disadvantages

Comments from the worksheets returned by the Task Force members under each fare increase option were classified by the type of issue raised. The responses were then compressed into statements that summarize each separate point made about the issues. Issues that were raised as both advantages and disadvantages are presented first to bring contrasting views into focus. Following the original set of options are additional options that were suggested by Task Force members. Presumably many of the issues raised regarding the predefined options would apply to the new options as well.

The types of issues raised include the following:

- Ridership: Extent and type of ridership gained and lost.
- Simplicity and Acceptability: As perceived by the riding public.
- Operating Cost and Efficiency: Will excess capacity be utilized or new capacity required?
- Operating Problems: A key issue area, covering required changes in fare collection equipment, operating procedures, and training practices.
- Equity Issues: Cost per passenger for rail trips is higher than for bus trips.
- Revenue Efficiency: Ridership loss per unit of revenue gain.
- Non-Cash Fares: Additional complexities for pass and token pricing.
- Operating Benefits: Possible impact on dollar bill handling and transfer abuse.
- Flexibility for Future: Fare increase options still left open.
- Implementation Cost: Extent of extra implementation costs required.

3. Documentation of Revenue and Ridership Results

To provide Task Force Members an understanding of the process whereby we obtained the revenue and ridership estimates, copies of computer printouts are included. These show additional information regarding the elasticity values used as inputs, as well as breakdowns by trip components (i.e. number of unlinked trips by mode), and full versus reduced fare. The selection of elasticities for this analysis was based on ridership data before and after the most recent 1981 systemwide fare increase, and was supported by a Strategic Planning review of an earlier Operations Planning memo.

cc: E. Sawyer
D. Mitchell-Bey

Attachments

FARE STRUCTURE ANALYSIS OF WEEKDAY CASH FARES: RIDERSHIP AND REVENUE IMPACTS

DESCRIPTION		FARE COMPONENTS Bus	Rail	One transfer	Rail Drop	Peak Surcharge	Two Transfers Bus to Rail	Two Transfers Other	RIDERSHIP CHANGE	REVENUE CHANGE	"REVENUE TO RIDERSHIP"RATIO
1 Across the board	(a)	.95	.95	.10					-1.2%	3.92%	-3.27
	(b)	1.00	1.00	.10					-2.4	8.10	-3.38
	(c)	1.05	1.05	.10					-3.4	11.98	-3.52
2 Transfer increase	(a)	.75	.75	.25					3.6	-8.36	-2.32
	(b)	.80	.80	.25					1.9	-4.05	-2.13
	(c)	.90	.90	.25					-0.8	4.16	-5.20
3 No Transfer*	(a)	.50	.75						5.2	-4.94*	-0.95*
										-12.3	-2.36
	(b)	.75	.75						-2.6	15.28*	-5.88*
										1.6	-0.62
	(c)	.75	1.00						-3.8	25.54*	-6.72*
										10.4	-2.74
4 Peak/Offpeak	(a)	.90	.90	.10		.10			-1.0	5.29	-5.29
	(b)	.90	.90	.10		.20			-2.0	10.50	-5.25
	(c)	.90	.90	.10		.30			-2.8	15.63	-5.58
5 Modal with a rail "drop"	(a)	.75	.75	.10	.20				2.8	-4.02	-1.44
	(b)	.80	.80	.10	.20				1.3	0.32	[0.25]
	(c)	.80	.80	.10	.30				0.6	4.53	[7.55]
	(d)	.90	.90	.10	.20				-1.3	8.49	-6.53
	(e)	.90	.90	.10	.40				-2.4	16.76	-6.98
	(f)	1.00	1.00	.10	.20				-3.6	16.48	-4.58

* The original revenue change and "revenue to ridership" ratio figures under the No Transfer option do not account for predicted diversion to monthly passes. The other numbers shown correct for such diversions according to the method used by the 1983 Fare Structure Experiment Report.

FARE STRUCTURE ANALYSIS OF WEEKDAY CASH FARES: RIDERSHIP AND REVENUE IMPACTS

DESCRIPTION		FARE COMPONENTS Bus	Rail	One transfer	Rail Drop	Peak Surcharge	Two Transfers Bus to Rail	Two Transfers Other	RIDERSHIP CHANGE	REVENUE CHANGE	"REVENUE TO RIDERSHIP"RATIO
6 Modal with a rail surcharge per trip	(a)	.90	1.00				.20	.10	-0.7	4.16	-5.94
7 Modal with a rail surcharge and separate transfers for full and reduced fares	(a)	.80	1.00				.40 .20	.20 .10	-0.1	3.51	-35.1
8 Peak And Modal with rail surcharge	(a)	.90	1.00			.20	.20	.10	-3.1	16.02	-5.17
9 Peak And Modal with rail surcharge and separate full/ reduced transfers	(a)	.80	1.00			.10	.40 .20	.20 .10	-1.4	9.51	-6.79
10 Offpeak:Flat/ Peak: Modal with a Rail "drop"	(a)	.80 .90	.80 .90	.10 .10	 .10				1.3	-0.21	-0.16
	(b)	.80 1.00	.80 1.00	.10 .10	 .30				-0.2	10.34	-51.7

FROM FARE STRUCTURE EXPERIMENT REPORT
by the Fare Collection Task Force, April, 1983

CHICAGO TRANSIT AUTHORITY

No Transfer Fare Structure

FOOTNOTES AND ASSUMPTIONS

A) Current data based on schedules prepared by Operations Planning. For purposes of consistency within this comparison, the linked trips for monthly passes sold in the Operations Planning models have been restated to 52 linked trips per pass sold.

B) Shifting of passengers from cash to Monthly Pass is based on the attached "Schedule of Ridership Distribution and Pass Benefit." (See pages 10, 12 and 14) However, no shifts were made for riders who will not experience a fare higher than that currently paid.

In shifting cash riders to Monthly Pass, it was assumed that the new pass ridership would use the pass at 40 linked (originating) trips per pass sold.

C) It was also assumed in both projections that a student fare Monthly Pass would be developed. This pass would enable student ridership (reduced fare) to shift from cash to Monthly Pass in the same manner as other reduced-fare ridership.

Projection 1
It is assumed that passengers will shift from cash to Monthly Pass at a rate of 1% benefit = 1% shift in cash passengers until the point of 60% benefit is reached. From 60% benefit on the shift will be 70%. However, in no case will the shift exceed 70% of cash fare passengers.

Projection 2
It is assumed that whenever discount exceed 20% there will be a 70% shift in cash passengers. The shift will not exceed 70%

D) With the development of a bi-weekly pass, pass buyers will divide equally between monthly and bi-weekly purchases.

OPTION B

(Raise Peak Fares Above Off-Peak Fares)

ADVANTAGES	DISADVANTAGES
RIDERSHIP: Promotes offpeak ridership as well as short discretionary trips (off peak).	**RIDERSHIP:** High fares would discourage short distance riders (especially non-CBD).
SIMPLICITY AND ACCEPTABILITY: May be acceptable to riding public. Riders can still ride at current rates for most of the day.	**SIMPLICITY AND ACCEPTABILITY:** There may be negative reaction associated with transitions between peak and off peak periods. Three issues are involved: communicating when the scheduled transitions occur, displeasure with those scheduled transition points, and disagreement over the actual time. Public outcry may be expected. Some fare system complexity is added.
OPERATING COST AND EFFICIENCY: Revenue will be gained without an operating cost increase. Operating efficiency will be increased by shifting trips from peak to off peak, resulting in better utilization of manpower and equipment.	**OPERATING COST AND EFFICIENCY:** Shifts away from peak periods may require additional off-peak service.
EQUITY ISSUES: The marginal cost of peak service is higher--providing a good reason to charge more.	**OPERATING PROBLEMS:** Passenger/Employee conflicts over peak/off-peak transitions will become a major issue. Other areas of concern are required farebox modifications, capacity of Multi-fare registers, increased complexity in the use of turnstyles, need for ticket agents to close and reopen, additional complexity of the fare auditing process, reinstruction of fare collecting employees, and lack of system-wide continuity.
REVENUE EFFICIENCY: There is likely to be less ridership loss for the same revenue gain.	**NON-CASH FARES:** Adds complexities to pass and token pricing: more types of passes? Peak and off-peak tokens? May involve increased administrative costs.

OPTION C

(Raise Rail Fares Above Bus Fares)

ADVANTAGES	DISADVANTAGES
SIMPLICITY AND ACCEPTABILITY: May be acceptable to riding public, has past practice, riders could use parallel bus lines.	**SIMPLICITY AND ACCEPTABILITY:** Some complexity is added. Will produce some public outcry and more confusion.
OPERATING BENEFITS: Increased dollar bill volume on buses may be delayed.	**OPERATING PROBLEMS:** Some areas of concern are possible programming of fareboxes for more fare types, capacity of multi-fare registers, reinstruction of fare collecting employees, lack of continuity between modes.
EQUITY ISSUES: If rail trips cost CTA more than bus trips, rail riders should pay more. Rail is a premium service (faster, more frequent, air-conditioned, smoother) and rail trips are longer than bus trips (over 6 versus under 3 miles)--riders should pay more for better service. Closer to distance-based fare structure.	**EQUITY ISSUES:** How to price the express buses? **OPERATING COST EFFICIENCY:** The price differential between modes may cause large passenger shifts from rail to bus. This may have some negative impacts on bus operating costs.
REVENUE EFFICIENCY: Rail riders tend to have a lower demand elasticity than bus--less ridership loss for same revenue gain.	**NON-CASH FARES:** Adds complexity to pass and token pricing. More types of passes and tokens? Would transfers be restructured (bus-only versus unlimited transfers?) or would there be rail cash "drops"?

OPTION D

(Raise Peak Fares Above Off-Peak Fares and Rail Fares Above Bus Fares)

ADVANTAGES	DISADVANTAGES
EQUITY ISSUES: Rail and peak riders would pay more for longer rides (rail) and more costly trips (peak).	**EQUITY ISSUES :** Peak rail riders might experience a significant increase in fare from current levels.
RIDERSHIP: Supports ridership increases for offpeak bus services, where there is ample capacity.	**SIMPLICITY AND ACCEPTABILITY:** The more complex the fare system, the more rider confusion exists. Complicated structures increase the potential for passenger relations problems to develop, which means an increase in tension on the system. Public outcry.
FLEXIBILITY FOR FUTURE: A more differentiated fare structure would yield more flexibility in the future on fares policy.	**OPERATING PROBLEMS:** Areas of concern are: capacity of multi-fare registers, reinstruction of fare collecting employees, complications resulting from combining (fare differentiation methods).
	NON-CASH FARES: Difficult to use simple prepaid fare devices such as passes, tokens in such a complex structure. Specific comments under this category in B and C also apply.

OPTION E

(Raise Transfer Prices Only)

ADVANTAGES	DISADVANTAGES
REVENUE: A transfer usage fee could be a good source for a small revenue increase, as many riders use transfers.	**REVENUE:** Minimal revenue increase.
OPERATING BENEFITS: No change in current fare collecting practices; easily accomplished. This might reduce transfer abuse if they (transfers) cost more.	**OPERATING PROBLEMS:** Increased temptation and reward resulting from abuse, fraudulent use and illegal sales of transfers.
EQUITY ISSUES: The price of a transfer as a percentage of the fare has been decreasing (no change in transfer price since fare was 45 cents). Should this trend continue? Transfer charge is a rough surrogate for a zone fare since transfer trips tend to be longer.	**EQUITY ISSUES:** Some riders who must transfer may feel discrimination. Financial burden not equally shared by riders.
SIMPLICITY AND ACCEPTABILITY: Riders may not object since this doesn't quite "look like" a fare increase.	**RIDERSHIP:** Makes it less inviting to take advantage of our superb grid system.
IMPLEMENTATION COST: Administrative cost to implement is negligible.	

OTHER OPTIONS

(As suggested by Task Force Members)

ADVANTAGES	**DISADVANTAGES**
ELIMINATE TRANSFERS	
"Increased revenue by eliminating transfer production costs and transfer fraud. Simplified fare structure. Increase of monthly or bi-monthly pass sales."	"Some riders would pay more when making connections."
ABOLISH TRANSFERS, RAIL (AND EXPRESS BUS) HIGHER THAN BUS	
"• Promotes pass purchase" "• Promotes short distance rides" "• Eliminate transfer abuse and costs of production"	"Increases cost to some riders."
RAISE TRANSFER PRICE, LOWER SINGLE RIDE FARE	
"Attraction to single ride users. Discourages transfer 'give aways'."	"Increased cost to multi-ride user."
DROP BUS OFF-PEAK FARE, RAISE RAIL PEAK FARE AND RAISE TRANSFER PRICE	

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.@850917 FARE STRUCTURES: across the board          BY: NKH             I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.====.======.=====.=======.=======.=====.=====.====.====.======.===================
 1 0 1 A -0.2900 .90   .40   232    91      0.95  .42   228.4 89.72 245.200 254.662 5.556 5.000 -1.6 -1.4 3.8589
 0 1 1 A -0.1200 .90   .40   143    22      0.95  .42   142.1 21.87 137.500 144.180 5.556 5.000 -0.6 -0.6 4.8592
 2 0 2 A -0.2900 1.00  .50   92     67      1.05  .52   90.71 66.24 125.500 129.690 5.000 4.000 -1.4 -1.1 3.3387
 1 1 2 A -0.2050 1.00  .50   96     14      1.05  .52   95.05 13.89     103 107.025 5.000 4.000 -1.0 -0.8 3.9078
 0 2 2 A -0.1200 1.00  .50   12     1       1.05  .52   11.93 0.995 12.5000 13.0439 5.000 4.000 -0.6 -0.5 4.3512
 3 0 3 A -0.2900 1.00  .50   9      6       1.05  .52   8.874 5.932      12 12.4023 5.000 4.000 -1.4 -1.1 3.3525
 2 1 3 A -0.2333 1.00  .50   28      7      1.05  .52   27.68 6.936 31.5000 32.6707 5.000 4.000 -1.1 -0.9 3.7165
 1 2 3 A -0.1767 1.00  .50   11      1      1.05  .52   10.91 0.993 11.5000 11.9719 5.000 4.000 -0.8 -0.7 4.1035
 4 0 4 A -0.2900 1.00  .50    1             1.05  .52   0.986     0       1 1.03530 5.000 4.000 -1.4    0 3.5300
 3 1 4 A -0.2475 1.00  .50    2             1.05  .52   1.976     0       2 2.07480 5.000 4.000 -1.2    0 3.7400
 2 2 4 A -0.2050 1.00  .50    8      2      1.05  .52   7.920 1.984       9 9.34768 5.000 4.000 -1.0 -0.8 3.8631
.
*GRAND-TOTAL  -              ----- -----                ----- ----- ------- -------             --------- ------
*                             634   211*                626.5 208.6 690.700 717.8                  -1.2    3.924
                     ..... END REPORT .....
```

16

```
.DATE               10:03:49  RID      41     09 JUL 85  HALL
.@850947 FARE STRUCTURES: across the board                BY: NKH              I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE       . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT., RED..ADULT.REDUCED.ADULT.  RED..ADULT. RED..INITIAL.   NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.= =======.=====.=====.=====.======= =====.===== =====.===== =======.======= =====.===== ====.==== ====== ===============
 1 0 1 A -0.2900 .90    .40    232    91     1.00   .45   225.0 87.95 245.200 264.578 11.11 12.50 -3.0 -3.4 7.9029
 0 1 1 A -0.1200 .90    .40    143    22     1.00   .45   141.2 21.69 137.500 150.961 11.11 12.50 -1.3 -1.4 9.7898
 2 0 2 A -0.2900 1.00   .50    92     67     1.10   .55   89.49 65.18 125.500 134.288 10.00 10.00 -2.7 -2.7 7.0024
 1 1 2 A -0.2050 1.00   .50    96     14     1.10   .55   94.14 13.73     103 111.106 10.00 10.00 -1.9 -1.9 7.8699
 0 2 2 A -0.1200 1.00   .50    12      1     1.10   .55   11.86 0.989 12.5000 13.5900 10.00 10.00 -1.2 -1.1 8.7200
 3 0 3 A -0.2900 1.00   .50    9       6     1.10   .55   8.755 5.837      12 12.8409 10.00 10.00 -2.7 -2.7 7.0075
 2 1 3 A -0.2333 1.00   .50    28      7     1.10   .55   27.39 6.846 31.5000 33.8943 10.00 10.00 -2.2 -2.2 7.6010
 1 2 3 A -0.1767 1.00   .50    11      1     1.10   .55   10.82 0.983 11.5000 12.4427 10.00 10.00 -1.6 -1.7 8.1974
 4 0 4 A -0.2900 1.00   .50     1            1.10   .55   0.973     0       1 1.07030 10.00 10.00 -2.7    0 7.0300
 3 1 4 A -0.2475 1.00   .50     2            1.10   .55   1.953     0       2 2.14830 10.00 10.00 -2.4    0 7.4150
 2 2 4 A -0.2050 1.00   .50     8      2     1.10   .55   7.845 1.961       9 9.70805 10.00 10.00 -1.9 -2.0 7.8672

*GRAND-TOTAL  -                ----- -------             ----- ----- ------- -----               --------- ------
*                               634     211*             619.4 205.2 690.700 746.628                  -2.4 8.0973
                     ..... END REPORT .....
```

lc

```
.DATE 02 AUG 85  07:46:25  RID      41    02 AUG 85  HALL
.0850917 FARE STRUCTURES: across the board          BY: NKH              I004160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.I.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.========.=====.=====.======.========.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.==================
 1 0 1 A -0.2900 .90    .40    232    91        1.05   .47    221.9 86.85 245.200 273.845 16.67 17.50 -4.4 -4.6 11.670
 0 1 1 A -0.1200 .90    .40    143    22        1.05   .47    140.4 21.58 137.500 157.563 16.67 17.50 -1.8 -1.9 14.591
 2 0 2 A -0.2900 1.00   .50    92     67        1.15   .57    88.35 64.51 125.500 138.373 15.00 14.00 -4.0 -3.7 10.257
 1 1 2 A -0.2050 1.00   .50    96     14        1.15   .57    93.29 13.63     103 115.053 15.00 14.00 -2.8 -2.6 11.702
 0 2 2 A -0.1200 1.00   .50    12     1         1.15   .57    11.80 0.984 12.5000 14.1309 15.00 14.00 -1.7 -1.6 13.047
 3 0 3 A -0.2900 1.00   .50    9      6         1.15   .57    8.643 5.777      12 13.2323 15.00 14.00 -4.0 -3.7 10.269
 2 1 3 A -0.2333 1.00   .50    28      7        1.15   .57    27.40 6.790 31.5000 35.0353 15.00 14.00 -3.2 -3.0 11.223
 1 2 3 A -0.1767 1.00   .50    11      1        1.15   .57    10.73 0.977 11.5000 12.8964 15.00 14.00 -2.5 -2.3 12.143
 4 0 4 A -0.2900 1.00   .50     1               1.15   .57    0.960     0       1 1.10400 15.00 14.00 -4.0    0 10.400
 3 1 4 A -0.2475 1.00   .50     2               1.15   .57    1.932     0       2 2.22480 15.00 14.00 -3.4    0 11.090
 2 2 4 A -0.2050 1.00   .50     8      2        1.15   .57    7.774 1.947       9 10.0499 15.00 14.00 -2.8 -2.7 11.666
.
*GRAND-TOTAL  -                -----  ------                ----  ----- ------- -------             --------  ------
*                               634     211*                612.9 203.0 690.700 773.475                 -3.4   11.984
                        ..... END REPORT .....
```

2a

```
.DATE 09 JUL 85  10:27:58  RID      43    09 JUL 85  HALL
.@850917 FARE STRUCTURES: transfer                   BY: NKH               I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.      REVENUE       . P E R   C E N T   C H A N G E S :
*D.R.T.X.ICITIES.ADULT..RED..ADULT.REDUCED.ADULT. RED..ADULT. RFD..INITIAL.  NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=|=======.=====.=====.=====.=======|=====.=====|=====.=====|=======.=======|=====.=====|====.====|======|====================
 1 0 1 t|-0.2900 .90    .40    232    91  |  .75   .25|244.6 104.1|245.200 209.475|-16.7 -37.5|5.43 14.4|-14.57|
 0 1 1 t|-0.1200 .90    .40    143    22  | 0.75   .25|146.2 23.25|137.500 115.463|-16.7 -37.5|2.24 5.68|-16.03|
 2 0 2 t|-0.2900 1.00   .50    92     67  | 1.00   .50|   92    67|125.500 125.500|    0     0|   0    0|     0|
 1 1 2 t|-0.2050 1.00   .50    96     14  | 1.00   .50|   96    14|    103     103|    0     0|   0    0|     0|
 0 2 2 t|-0.1200 1.00   .50    12      1  | 1.00   .50|   12     1|12.5000 12.5000|    0     0|   0    0|     0|
 3 0 3 t|-0.2900 1.00   .50    9      6   | 1.00   .50|    9     6|     12      12|    0     0|   0    0|     0|
 2 1 3 t|-0.2333 1.00   .50    28      7  | 1.00   .50|   28     7|31.5000 31.5000|    0     0|   0    0|     0|
 1 2 3 t|-0.1767 1.00   .50    11      1  | 1.00   .50|   11     1|11.5000 11.5000|    0     0|   0    0|     0|
 4 0 4 t|-0.2900 1.00   .50     1         | 1.00   .50|    1     0|      1       1|    0     0|   0    0|     0|
 3 1 4 t|-0.2475 1.00   .50     2         | 1.00   .50|    2     0|      2       2|    0     0|   0    0|     0|
 2 2 4 t|-0.2050 1.00   .50     8      2  | 1.00   .50|    8     2|      9       9|    0     0|   0    0|     0|
*GRAND-TOTAL  -                -----  -------          ----- ----- ------- -------             --------- ------
*                               634     211*           649.8 225.4 690.700 632.938                3.6    -8.363
               ..... END REPORT .....
```

2b

```
.DATE 06 AUG 85  08:42:45  RID      43    06 AUG 85  HALL
.@850947 FARE STRUCTURE6: transfer                  BY: NKH              I004160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL..TOTREV.
*=.=.=.=.=======.======.=====.=====.=======.======.=====.=====.=====.=======.=======.=====.=====.====.====.======.==================
 1 0 1 t -0.2900 .90    .40    232    91      0.80   .28   240.1 100.8 245.200 220.304 -11.1 -30.0 3.49 10.8 -10.15
 0 1 1 t -0.1200 .90    .40    143    22      0.80   .28   145.0 22.95 137.500 122.426 -11.1 -30.0 1.49 4.32 -10.96
 2 0 2 t -0.2900 1.00   .50    92     67      1.05   .53   90.71 65.88 125.500 130.162 5.000 6.000 -1.4 -1.7 3.7147
 1 1 2 t -0.2050 1.00   .50    96     14      1.05   .53   95.05 13.83     103 107.132 5.000 6.000 -1.0 -1.2 4.0117
 0 2 2 t -0.1200 1.00   .50    12     1       1.05   .53   11.93 0.993 12.5000 13.0520 5.000 6.000 -0.6 -0.7 4.4224
 3 0 3 t -0.2900 1.00   .50    9      6       1.05   .53   8.874 5.900      12 12.4447 5.000 6.000 -1.4 -1.7 3.7058
 2 1 3 t -0.2333 1.00   .50    28      7      1.05   .53   27.68 6.906 31.5000 32.7242 5.000 6.000 -1.1 -1.3 3.8864
 1 2 3 t -0.1767 1.00   .50    11      1      1.05   .53   10.91 0.990 11.5000 11.9802 5.000 6.000 -0.8 -1.0 4.1757
 4 0 4 t -0.2900 1.00   .50     1             1.05   .53   0.986     0       1 1.03530 5.000 6.000 -1.4    0 3.5300
 3 1 4 t -0.2475 1.00   .50     2             1.05   .53   1.976     0       2 2.07480 5.000 6.000 -1.2    0 3.7400
 2 2 4 t -0.2050 1.00   .50     8      2      1.05   .53   7.920 1.976       9 9.36328 5.000 6.000 -1.0 -1.2 4.0364
.
*GRAND-TOTAL  -                                            ----- ----- ------- -------             --------- ------
*                              634    211*                 641.1 220.2 690.700 662.699                   1.9 -4.054
                      ..... END REPORT .....
```

2c

```
.DATE 06 AUG 85  11:11:43  RID      43    06 AUG 85  HALL
.0850917 FARE STRUCTURE6: transfer                   BY: NKH              1001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.================
 1 0 1 t -0.2900 .90    .40    232    94      0.90  .33   232.0 96.21 245.200 240.549     0 -17.5    0 5.73 -1.897
 0 1 1 t -0.1200 .90    .40    143    22      0.90  .33   143.0 22.51 137.500 136.128     0 -17.5    0 2.32 -0.998
 2 0 2 t -0.2900 1.00   .50    92     67      1.15  .58   88.35 64.18 125.500 138.827 15.00 16.00 -4.0 -4.2 10.619
 1 1 2 t -0.2050 1.00   .50    96     14      1.15  .59   93.29 13.58     103 115.160 15.00 16.00 -2.8 -3.0 11.806
 0 2 2 t -0.1200 1.00   .50    12     1       1.15  .58   11.80 0.982 12.5000 14.1396 15.00 16.00 -1.7 -1.8 13.117
 3 0 3 t -0.2900 1.00   .50    9      6       1.15  .58   8.643 5.748      12 13.2733 15.00 16.00 -4.0 -4.2 10.611
 2 1 3 t -0.2333 1.00   .50    28      7      1.15  .58   27.10 6.762 31.5000 35.0870 15.00 16.00 -3.2 -3.4 11.387
 1 2 3 t -0.1767 1.00   .50    11      1      1.15  .58   10.73 0.974 11.5000 12.9044 15.00 16.00 -2.5 -2.6 12.212
 4 0 4 t -0.2900 1.00   .50     1             1.15  .58   0.960     0       1 1.10400 15.00 16.00 -4.0      0 10.400
 3 1 4 t -0.2475 1.00   .50     2             1.15  .58   1.932     0       2 2.22180 15.00 16.00 -3.4      0 11.090
 2 2 4 t -0.2050 1.00   .50     8      2      1.15  .58   7.774 1.940       9 10.0653 15.00 16.00 -2.8 -3.0 11.837
.
*GRAND-TOTAL  -               ----   -----                ----- ----- ------- -------              -------- -------
*                              634    211*                625.6 212.9 690.700 749.459                 -0.8   4.164
                   ..... END REPORT .....
```

3a

```
.DATE 10 JUL 85  11:51:13  RID      44     10 JUL 85  HALL
.0850917 FARE STRUCTURES: no transfer                  BY: NKA              I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.        REVENUE       . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT.,RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.   NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.========.=====.=====.====.====.======.=================
 1 0 1   -0.2900 .90    .40    232    91        0.500 0.250 273.9  104.1 245.200 162.975 -44.4 -37.5 18.1  14.4 -33.53
 0 1 1   -0.1200 .90    .40    143    22        0.750 0.375 146.2  22.17 137.500 117.964 -16.7 -6.25 2.24  0.77 -14.21
 2 0 2   -0.2900 1.00   .50    92     67            1 0.500    92     67 125.500 125.500     0     0    0     0      0
 1 1 2   -0.2050 1.00   .50    96     14        1.250 0.625 91.72  13.38     103 123.013    25    25 -4.5  -4.4 19.430
 0 2 2   -0.1200 1.00   .50    12      1        1.500 0.750 11.44  0.953 12.5000 17.8748    50    50 -4.7  -4.7 42.998
 3 0 3   -0.2900 1.00   .50    9       6        1.500 0.750 8.013  5.342      12 16.0260    50    50 -11.  -11. 33.550
 2 1 3   -0.2333 1.00   .50    28      7        1.750 0.875 24.65  6.163 31.5000 48.5301    75    75 -12.  -12. 54.064
 1 2 3   -0.1767 1.00   .50    11      1            2     1 9.776  0.889 11.5000 20.4410   100   100 -11.  -11. 77.748
 4 0 4   -0.2900 1.00   .50     1                   2     1 0.824      0       1 1.64800   100   100 -18.     0 64.800
 3 1 4   -0.2475 1.00   .50     2               2.250 1.125 1.652      0       2 3.71700   125   125 -17.     0 85.850
 2 2 4   -0.2050 1.00   .50     8      2        2.500 1.250 6.708  1.677       9 18.8663   150   150 -16.  -16. 109.63
*GRAND-TOTAL  -                ----- -------              ----- ----- ------- --------             ---------- ------
*                                634    211*              666.9 221.7 690.700 656.555                    5.2   -4.944
                       ..... END REPORT .....
```

36

```
.DATE 05 AUG 85  15:32:24  RID      44    05 AUG 85  HALL
.@850917 FARE STRUCTURES: no transfer                 BY: NKH             I004460
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.========.======.======.=====.========.=====.=====.======.=====.=======.=======.=====.=====.====.====.======.============
 1 0 1    -0.2900 .90 .   .40    232     91      0.750 0.375 244.6 92.72 245.200 218.220 -16.7 -6.25 5.43 1.89 -11.00
 0 1 1    -0.1200 .90     .40    143     22      0.750 0.375 116.2 22.17 137.500 117.964 -16.7 -6.25 2.24 0.77 -14.21
 2 0 2    -0.2900 1.00    .50    92      67      1.500 0.750 81.91 59.65 125.500 167.603    50    50 -11. -11. 33.548
 1 1 2    -0.2050 1.00    .50    76      14      1.500 0.750 88.44 12.90     103 142.335    50    50 -7.9 -7.9 38.189
 0 2 2    -0.1200 1.00    .50    12      1       1.500 0.750 11.44 0.953 12.5000 17.8748    50    50 -4.7 -4.7 42.998
 3 0 3    -0.2900 1.00    .50    9      6        2.250 1.120 7.194 4.801      12 21.5636   125 124.0 -20. -20. 79.697
 2 1 3    -0.2333 1.00    .50    28       7      2.250 1.120 23.39 5.852 31.5000 59.1817   125 124.0 -16. -16. 87.878
 1 2 3    -0.1767 1.00    .50    11       1      2.250 1.120 9.600 0.873 11.5000 22.5778   125 124.0 -13. -13. 96.329
 4 0 4    -0.2900 1.00    .50    1                   3 1.500 0.747     0       1 2.24100   200   200 -25.    0 124.10
 3 1 4    -0.2475 1.00    .50    2               3.000 1.500 1.560     0       2 4.68000   200   200 -22.    0 134.00
 2 2 4    -0.2050 1.00    .50    8        2      3.000 1.500 6.513 1.628       9 21.9810   200   200 -19. -19. 144.23
.
*GRAND-TOTAL  -                 ----    -----                ----- ----- ------- -----             --------  ------
                                634     211*                 621.6 201.6 690.700 796.222              -2.6     15.278
                     ..... END REPORT .....
```

3c

```
.DATE 10 JUL 85  12:05:21  RID      44     10 JUL 85  HALL
.@850947 FARE STRUCTURES: no transfer               BY: NKH              I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VUL.S.NEW FARES  .NEW VOLUMES.      REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT.,RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.==================
 1 0 1   -0.2900 .90    .40    232     91     0.750 0.375 244.6 92.72 245.200 218.220 -16.7 -6.25 5.43 1.89 -11.00
 0 1 1   -0.1200 .90    .40    143     22         1 0.500 141.2 21.42 137.500 151.910 11.11 25.00 -1.3 -2.6 10.480
 2 0 2   -0.2900 1.00'  .50    92      67     1.500 0.750 81.91 59.65 125.500 167.603    50    50 -11. -11. 33.548
 1 1 2   -0.2050 1.00  ..50    96      14     1.750 0.875 85.83 12.52     103 161.158    75    75 -11. -11. 56.464
 0 2 2   -0.1200 1.00   .50    12      1          2     1 11.08 0.923 12.5000 23.0830   100   100 -7.7 -7.7 84.664
 3 0 3   -0.2900 1.00   .50    9      6       2.250 1.125 7.494 4.796      12 21.5820   125   125 -20. -20. 79.850
 2 1 3   -0.2333 1.00   .50    28      7      2.500 1.250 22.91 5.727 31.5000 64.4338   150   150 -18. -18. 104.55
 1 2 3   -0.1767 1.00   .50    11      1      2.750 1.375 9.324 0.848 11.5000 26.8070   175   175 -15. -15. 133.10
 4 0 4   -0.2900 1.00   .50     1                 3 1.500 0.747     0       1 2.24100   200   200 -25.    0 124.10
 3 1 4   -0.2475 1.00   .50     2             3.250 1.625 1.537   . 0       2 4.99525   225   225 -23.    0 149.76
 2 2 4   -0.2050 1.00   .50     8      2      3.500 1.750 6.364 1.591       9 25.0583   250   250 -20. -20. 178.43
*GRAND-TOTAL  -                ----- ------              ----- ----- ------- -----               --------- ------
*                               634   211*               612.7 200.2 690.700 867.091                  -3.8   25.538
                 ..... END REPORT .....
```

4a

```
.DATE 02 AUG 85  14:05:24  RID     40    02 AUG 85  HALL
.@850947 FARE STRUCTURES: Peak/Off-Peak                BY: NKH                I001460
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.         REVENUE       . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.===================
 1 0 1 P -0.2068 0.90  0.400 138.7 54.4200 1.000 0.450 135.7 53.11 146.598 159.600 11.11 12.50 -2.2 -2.4 8.8692
 0 1 1 P -0.0856 0.90  0.400 85.51 13.1600 1.000 0.450 84.74 13.03 82.2230 90.6035 11.11 12.50 -0.9 -1.0 10.192
 2 0 2 P -0.2068 1.00  0.500 55.02 40.0700 1.100 0.550 53.95 39.29 75.0550 80.9545 10.00 10.00 -1.9 -1.9 7.8602
 1 1 2 P -0.1462 1.00  0.500 57.41 8.37200 1.100 0.550 56.62 8.256 61.5960 66.8228 10.00 10.00 -1.4 -1.4 8.4856
 0 2 2 P -0.0856 1.00  0.500 7.176 0.59800 1.100 0.550 7.118 0.593 7.47500 8.15595 10.00 10.00 -0.8 -0.8 9.1097
 3 0 3 P -0.2068 1.00  0.500 5.382 3.58800 1.100 0.550 5.277 3.518 7.17600 7.73960 10.00 10.00 -2.0 -2.0 7.8540
 2 1 3 P -0.1664 1.00  0.500 16.74 4.18600 1.100 0.550 16.48 4.120 18.8330 20.3940 10.00 10.00 -1.6 -1.6 8.2886
 1 2 3 P -0.1260 1.00  0.500 6.578 0.59800 1.100 0.550 6.500 0.591 6.87700 7.47505 10.00 10.00 -1.2 -1.2 8.6964
 4 0 4 P -0.2068 1.00  0.500 0.598         0 1.100 0.550 0.586       0 0.59800 0.64460 10.00 10.00 -2.0    0 7.7926
 3 1 4 P -0.1765 1.00  0.500 1.196         0 1.100 0.550 1.176       0 1.19600 1.29360 10.00 10.00 -1.7    0 8.1605
 2 2 4 P -0.1462 1.00  0.500 4.784 1.19600 1.100 0.550 4.718 1.180 5.38200 5.83880 10.00 10.00 -1.4 -1.3 8.4876
 1 0 1 O -0.4137 .90   .40   93.26 36.5800 0.900 0.400 93.26 36.58 98.5660 98.5660     0     0    0    0      0
 0 1 1 O -0.1712 .90   .40   57.49 8.84400 0.900 0.400 57.49 8.844 55.2786 55.2786     0     0    0    0      0
 2 0 2 O -0.4137 1.00  .50   36.98 26.9300     1 0.500 36.98 26.93 50.4450 50.4450     0     0    0    0      0
 1 1 2 O -0.2924 1.00  .50   38.59 5.62800     1 0.500 38.59 5.628 41.4040 41.4040     0     0    0    0      0
 0 2 2 O -0.1712 1.00  .50   4.824 0.40200     1 0.500 4.824 0.402 5.02500 5.02500     0     0    0    0      0
 3 0 3 O -0.4137 1.00  .50   3.618 2.41200     1 0.500 3.618 2.412 4.82400 4.82400     0     0    0    0      0
 2 1 3 O -0.3328 1.00  .50   11.26 2.81400     1 0.500 11.26 2.814 12.6670 12.6670     0     0    0    0      0
 1 2 3 O -0.2521 1.00  .50   4.422 0.40200     1 0.500 4.422 0.402 4.62300 4.62300     0     0    0    0      0
.4 0 4 O -0.4137 1.00  .50   0.402         0     1 0.500 0.402       0 0.40200 0.40200     0     0    0    0      0
 3 1 4 O -0.3531 1.00  .50   0.804         0     1 0.500 0.804       0 0.80400 0.80400     0     0    0    0      0
 2 2 4 O -0.2924 1.00  .50   3.216 0.80400     1 0.500 3.216 0.804 3.61800 3.61800     0     0    0    0      0
.
*GRAND-TOTAL  -
                             ----- -------             ----- ----- ------- -----                  ------ ------
*                            634.0 211.004             627.7 208.5 690.666 727.179                  -1.0  5.287
                       ..... END REPORT .....
```

4b

```
.DATE 09 JUL 85  09:43:23  RID      40     09 JUL 85  HALL
.0850917 FARE STRUCTURES: Peak/Off-Peak               BY: NKH            1004160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.      REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X ICITIES.ADULT.,RED..ADULT.REDUCED ADULT. RED. ADULT. RED.  INITIAL.   NEW    AFARE.BFARE AVOL.BVOL TOTREV
*=.=.=.= =======.=====.=====.=====.======= =====.===== =====.===== =======.======= =====.===== ====.==== ====== ================
 1 0 1 P -0.2068 0.90   0.400 138.7 54.4200 1.100 0.500 133.1 51.98 146.598 172.400 22.22 25.00 -4.0 -4.5 17.601
 0 1 1 P -0.0856 0.90   0.400 85.51 43.1600 1.100 0.500 84.06 12.91 82.2230 98.9210 22.22 25.00 -1.7 -1.9 20.308
 2 0 2 P -0.2068 1.00   0.500 55.02 40.0700 1.200 0.600 52.99 38.59 75.0550 86.7420 20.00 20.00 -3.7 -3.7 15.571
 1 1 2 P -0.1462 1.00   0.500 57.41 8.37200 1.200 0.600 55.90 8.152 61.5960 71.9712 20.00 20.00 -2.6 -2.6 16.844
 0 2 2 P -0.0856 1.00   0.500 7.176 0.59800 1.200 0.600 7.065 0.589 7.47500 8.83140 20.00 20.00 -1.5 -1.5 18.146
 3 0 3 P -0.2068 1.00   0.500 5.382 3.58800 1.200 0.600 5.183 3.456 7.17600 8.29320 20.00 20.00 -3.7 -3.7 15.569
 2 1 3 P -0.1664 1.00   0.500 16.74 4.18600 1.200 0.600 16.24 4.061 18.8330 21.9246 20.00 20.00 -3.0 -3.0 16.416
 1 2 3 P -0.1260 1.00   0.500 6.578 0.59800 1.200 0.600 6.429 0.584 6.87700 8.06520 20.00 20.00 -2.3 -2.3 17.278
 4 0 4 P -0.2068 1.00   0.500 0.598       0 1.200 0.600 0.576     0 0.59800 0.69120 20.00 20.00 -3.7    0 15.585
 3 1 4 P -0.1765 1.00   0.500 1.196       0 1.200 0.600 1.158     0 1.19600 1.38960 20.00 20.00 -3.2    0 16.187
 2 2 4 P -0.1462 1.00   0.500 4.784 1.19600 1.200 0.600 4.659 1.165 5.38200 6.28980 20.00 20.00 -2.6 -2.6 16.867
 1 0 1 U -0.4137 .90    .40   93.26 36.5800 0.900 0.400 93.26 36.58 98.5660 98.5660     0     0    0    0      0
 0 1 1 U -0.1712 .90    .40   57.49 8.84400 0.900 0.400 57.49 8.844 55.2786 55.2786     0     0    0    0      0
 2 0 2 U -0.4137 1.00   .50   36.98 26.9300     1 0.500 36.98 26.93 50.4450 50.4450     0     0    0    0      0
 1 1 2 U -0.2924 1.00   .50   38.59 5.62800     1 0.500 38.59 5.628 41.4040 41.4040     0     0    0    0      0
 0 2 2 U -0.1712 1.00   .50   4.824 0.40200     1 0.500 4.824 0.402 5.02500 5.02500     0     0    0    0      0
 3 0 3 U -0.4137 1.00   .50   3.618 2.41200     1 0.500 3.618 2.412 4.82400 4.82400     0     0    0    0      0
 2 1 3 U -0.3328 1.00   .50   11.26 2.81400     1 0.500 11.26 2.814 12.6670 12.6670     0     0    0    0      0
 1 2 3 U -0.2521 1.00   .50   4.422 0.40200     1 0.500 4.422 0.402 4.62300 4.62300     0     0    0    0      0
 4 0 4 U -0.4137 1.00   .50   0.402       0     1 0.500 0.402     0 0.40200 0.40200     0     0    0    0      0
 3 1 4 U -0.3531 1.00   .50   0.804       0     1 0.500 0.804     0 0.80400 0.80400     0     0    0    0      0
 2 2 4 U -0.2924 1.00   .50   3.216 0.80400     1 0.500 3.216 0.804 3.61800 3.61800     0     0    0    0      0

*GRAND-TOTAL  -               ----- -------             ----- ----- ------- -----                   ------ ------
*                             634.0 211.004             622.2 206.3 690.666 763.476                   -2.0 10.498
                   ..... END REPORT .....
```

4c

```
.DATE 02 AUG 85   11:57:53  RID      40     02 AUG 85  HALL
.0850947 FARE STRUCTURES: Peak/Off-Peak               BY: NKH            I004160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.      REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVUL.BVUL.TOTREV.
*=.=.=.=.=======,=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.=================
 1 0 1 P -0.2068 0.90   0.400 138.7 54.4200 1.200 0.550 130.7 50.98 146.598 184.879 33.33 37.50 -5.8 -6.3 26.113
 0 1 1 P -0.0856 0.90'  0.400 85.51 13.1600 1.200 0.550 83.44 12.81 82.2230 107.174 33.33 37.50 -2.4 -2.7 30.346
 2 0 2 P -0.2068 1.00   0.500 55.02 40.0700 1.300 0.650 52.13 37.97 75.0550 92.4495 30.00 30.00 -5.3 -5.2 23.176
 1 1 2 P -0.1462 1.00   0.500 57.41 8.37200 1.300 0.650 55.26 8.059 61.5960 77.0764 30.00 30.00 -3.7 -3.7 25.132
 0 2 2 P -0.0856 1.00   0.500 7.176 0.59800 1.300 0.650 7.018 0.585 7.47500 9.50365 30.00 30.00 -2.2 -2.2 27.139
 3 0 3 P -0.2068 1.00   0.500 5.382 3.58800 1.300 0.650 5.099 3.400 7.17600 8.83870 30.00 30.00 -5.3 -5.2 23.170
 2 1 3 P -0.1664 1.00   0.500 16.74 4.18600 1.300 0.650 16.03 4.008 18.8330 23.4442 30.00 30.00 -4.2 -4.3 24.485
 1 2 3 P -0.1260 1.00   0.500 6.578 0.59800 1.300 0.650 6.365 0.579 6.87700 8.65085 30.00 30.00 -3.2,-3.2 25.794
 4 0 4 P -0.2068 1.00   0.500 0.598       0 1.300 0.650 0.567     0 0.59800 0.73740 30.00 30.00 -5.2    0 23.261
 3 1 4 P -0.1765 1.00   0.500 1.196       0 1.300 0.650 1.142     0 1.19600 1.48460 30.00 30.00 -4.5    0 24.130
 2 2 4 P -0.1462 1.00   0.500 4.784 1.19600 1.300 0.650 4.605 1.151 5.38200 6.73465 30.00 30.00 -3.7 -3.8 25.133
 1 0 1 O -0.4137 .90    .40   93.26 36.5800 0.900 0.400 93.26 36.58 98.5660 98.5660     0     0    0    0      0
 0 1 1 O -0.1742 .90    .40   57.49 8.84400 0.900 0.400 57.49 8.844 55.2786 55.2786     0     0    0    0      0
 2 0 2 O -0.4137 1.00   .50   36.98 26.9300     1 0.500 36.98 26.93 50.4450 50.4450     0     0    0    0      0
 1 1 2 O -0.2924 1.00   .50   38.59 5.62800     1 0.500 38.59 5.628 41.4040 41.4040     0     0    0    0      0
 0 2 2 O -0.1712 1.00   .50   4.824 0.40200     1 0.500 4.824 0.402 5.02500 5.02500     0     0    0    0      0
 3 0 3 O -0.4137 1.00   .50   3.618 2.41200     1 0.500 3.618 2.412 4.82400 4.82400     0     0    0    0      0
 2 1 3 O -0.3328 1.00   .50   11.26 2.81400     1 0.500 11.26 2.814 12.6670 12.6670     0     0    0    0      0
 1 2 3 O -0.2521 1.00   .50   4.422 0.40200     1 0.500 4.422 0.402 4.62300 4.62300     0     0    0    0      0
 4 0 4 O -0.4137 1.00   .50   0.402       0     1 0.500 0.402     0 0.40200.0.40200     0     0    0    0      0
 3 1 4 O -0.3531 1.00   .50   0.804       0     1 0.500 0.804     0 0.80400 0.80400     0     0    0    0      0
 2 2 4 O -0.2924 1.00   .50   3.216 0.80400     1 0.500 3.216 0.804 3.61800 3.61800     0     0    0    0      0
.
*GRAND-TOTAL  -               ----- -------             ----- ----- ------- -------                   ----- -------
*                             634.0 211.004             617.2 204.4 690.666 798.629                    -2.8  15.631
                      ..... END REPORT .....
```

5a

```
.DATE 02 AUG 85  15:41:29  RID      42     02 AUG 85  HALL
.0850917 FARE STRUCTURES: mode                        BY: NKH            1001460
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.   . REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.
 1 0 1 m -0.2900 .90   .40   232   91     0.750 0.320 244.6 97.06 245.200 244.509 -16.7 -20.0 5.43 6.66 -12.52
 0 1 1 m -0.1200 .90   .40   143   22     0.950 0.400 142.1 22.00 137.500 143.795 5.556     0 -0.6    0 4.5782
 2 0 2 m -0.2900 1.00  .50   92    67     0.850 0.420 96.43 70.47 125.500 111.563 -15.0 -16.0 4.82 5.18 -11.11
 1 1 2 m -0.2050 1.00  .50   96    14     1.050 0.520 95.05 13.89     103 107.025 5.000 4.000 -1.0 -0.8 3.9078
 0 2 2 m -0.1200 1.00  .50   12    1      1.250 0.620 11.68 0.975 12.5000 15.2045    25 24.00 -2.7 -2.5 21.636
 3 0 3 m -0.2900 1.00  .50   9     6      0.850 0.420 9.433 6.310      12 10.6683 -15.0 -16.0 4.81 5.17 -11.10
 2 1 3 m -0.2333 1.00  .50   28     7     1.050 0.520 27.68 6.936 31.5000 32.6707 5.000 4.000 -1.1 -0.9 3.7165
 1 2 3 m -0.1767 1.00  .50   11     1     1.250 0.620 10.58 0.963 11.5000 13.8224    25 24.00 -3.8 -3.7 20.192
 4 0 4 m -0.2900 1.00  .50    1           0.850 0.452 1.048     0       1 0.89080 -15.0 -9.60 4.80    0 -10.92
 3 1 4 m -0.2475 1.00  .50    2           1.050 0.520 1.976     0       2 2.07480 5.000 4.000 -1.2    0 3.7400
 2 2 4 m -0.2050 1.00  .50    8     2     1.250 0.620 7.644 1.914       9 10.7447    25 24.00 -4.5 -4.3 19.352
.
*GRAND-TOTAL  -             ----  -----               ----- ----- ------- -----             --------- ------
*                            634   211*               648.2 220.5 690.700 662.965                2.8   -4.015
                   ..... END REPORT .....
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56

```
.DATE 06 AUG 85  11:52:10  RID      42    06 AUG 85  HALL
.@850917 FARE STRUCTURES: mode                     BY: NKH               I004160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.       REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.I.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL .BVOL.TOTREV.
*=.=.=.=.========.======.=====.======.=========.======.======.======.======.=========.=========.======.======.=====.=====.=======.==================
 1 0 1 m -0.2900 .90   .40   232   91       0.800 0.350 240.1 94.59 245.200 225.187 -11.1 -12.5 3.49 3.95 -8.162
 0 1 1 m -0.1200 .90   .40   143   22       1.000 0.450 141.2 21.69 137.500 150.961 11.11 12.50 -1.3 -1.4 9.7898
 2 0 2 m -0.2900 1.00  .50    92   67       0.900 0.450 94.85 69.08 125.500 146.451 -10.0 -10.0 3.10 3.10 -7.240
 1 1 2 m -0.2050 1.00  .50    96   14       1.100 0.550 94.14 13.73     103 111.106 10.00 10.00 -1.9 -1.9 7.8699
 0 2 2 m -0.1200 1.00  .50    12    1       1.300 0.650 11.63 0.969 12.5000 15.7489 30.00 30.00 -3.1 -3.1 25.991
 3 0 3 m -0.2900 1.00  .50    9    6        0.900 0.450 9.279 6.186      12 11.1348 -10.0 -10.0 3.10 3.10 -7.210
 2 1 3 m -0.2333 1.00  .50    28    7       1.100 0.550 27.39 6.846 31.5000 33.8943 10.00 10.00 -2.2 -2.2 7.6010
 1 2 3 m -0.1767 1.00  .50    11    1       1.300 0.650 10.50 0.955 11.5000 14.2708 30.00 30.00 -4.5 -4.5 24.094
 4 0 4 m -0.2900 1.00  .50     1           0.900 0.450 1.031     0       1 0.92790 -10.0 -10.0 3.10    0 -7.210
 3 1 4 m -0.2475 1.00  .50     2           1.100 0.550 1.953     0       2 2.14830 10.00 10.00 -2.4    0 7.4150
 2 2 4 m -0.2050 1.00  .50     8    2       1.300 0.650 7.583 1.896       9 11.0903 30.00 30.00 -5.2 -5.2 23.226
.
*GRAND-TOTAL  -
*                                                 ----- ----- ------- -------                 ---------- -------
                          634    211*              639.7 215.9 690.700 692.920                       1.3   0.321
               ..... END REPORT .....
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5c

```
.DATE 30 JUL 85  14:42:05  RED      42    30 JUL 85  HALL
.@850917 FARE STRUCTURES: mode                       BY: NMH             1001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.===================
 1 0 1 m -0.2900 .90    .40    232    91      0.800 0.350 240.1 94.59 245.200 225.187 -11.1 -12.5 3.49 3.95 -8.162
 0 1 1 m -0.1200 .90    .40    143    22      1.100 0.500 139.6 21.42 137.500 164.270 22.22 25.00 -2.4 -2.6 19.469
 2 0 2 m -0.2900 1.00   .50    92     67      0.900 0.450 94.85 69.08 125.500 116.451 -10.0 -10.0 3.10 3.10 -7.210
 1 1 2 m -0.2050 1.00   .50    96     14      1.200 0.600 92.49 13.49     103 119.082 20.00 20.00 -3.7 -3.6 15.614
 0 2 2 m -0.1200 1.00   .50    12     1       1.500 0.750 11.44 0.953 12.5000 17.8748    50    50 -4.7 -4.7 42.998
 3 0 3 m -0.2900 1.00   .50    9      6       0.900 0.450 9.279 6.186      12 11.1348 -10.0 -10.0 3.10 3.10 -7.210
 2 1 3 m -0.2333 1.00   .50    28      7      1.200 0.600 26.84 6.709 31.5000 36.2334 20.00 20.00 -4.1 -4.2 15.027
 1 2 3 m -0.1767 1.00   .50    11      1      1.500 0.750 10.25 0.932 11.5000 16.0740    50    50 -6.8 -6.8 39.774
 4 0 4 m -0.2900 1.00   .50     1             0.900 0.450 1.031     0       1 0.92790 -10.0 -10.0 3.10    0 -7.210
 3 1 4 m -0.2475 1.00   .50     2             1.200 0.600 1.912     0       2 2.29440 20.00 20.00 -1.4    0 14.720
 2 2 4 m -0.2050 1.00   .50     8      2      1.500 0.750 7.370 1.043       9 12.4373    50    50 -7.9 -7.9 38.192
.
*    GRAND-TOTAL  -            ----  ------                ----- ----- ------- -------             --------- -------
*                               634    211*                635.2 215.2 690.700 721.967                  0.6   4.527
                       ..... END REPORT .....
```

5d

```
.DATE 09 JUL 85  10:18:23  RID      42     09 JUL 85  HALL
.@850947 FARE STRUCTURES* mode                         BY: NKH                   I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.I.X.ICITIES.ADULT.. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.   NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.==================
 1 0 1 m -0.2900 .90    .40    232    91      .90  .40   232.0 91.00 245.200 245.200     0     0    0    0      0
 0 1 1 m -0.1200 .90    .40    143    22     1.10  .50   139.6 21.42 137.500 164.270 22.22 25.00 -2.4 -2.6 19.469
 2 0 2 m -0.2900 1.00   .50    92     67     1.00  .50      92    67 125.500 125.500     0     0    0    0      0
 1 1 2 m -0.2050 1.00   .50    96     14     1.20  .60   92.49 13.49     103 119.082 20.00 20.00 -3.7 -3.6 15.614
 0 2 2 m -0.1200 1.00   .50    12      1     1.40  .70   11.53 0.961 12.5000 16.8147 40.00 40.00 -3.9 -3.9 34.518
 3 0 3 m -0.2900 1.00   .50    9       6     1.00  .50       9     6      12      12     0     0    0    0      0
 2 1 3 m -0.2333 1.00   .50    28      7     1.20  .60   26.84 6.709 31.5000 36.2334 20.00 20.00 -4.1 -4.2 15.027
 1 2 3 m -0.1767 1.00   .50    11      1     1.40  .70   10.37 0.943 11.5000 15.1781 40.00 40.00 -5.7 -5.7 31.984
 4 0 4 m -0.2900 1.00   .50     1            1.00  .50       1     0       1       1     0     0    0    0      0
 3 1 4 m -0.2475 1.00   .50     2            1.20  .60   1.912     0       2 2.29440 20.00 20.00 -4.4    0 14.720
 2 2 4 m -0.2050 1.00   .50     8      2     1.40  .70   7.471 1.868       9 11.7670 40.00 40.00 -6.6 -6.6 30.744
*GRAND-TOTAL  -               ------  ------              ----- ----- ------- -----             --------- ------
*                              634     211*              624.2 209.4 690.700 749.340                 -1.3  8.490
                 ..... END REPORT .....
```

5e

```
.DATE 02 AUG 85  14:50:02  RID      42    02 AUG 85  HALL
.0850947 FARE STRUCTURES: mode                        BY: NKH             C001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE       . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.========.======.=====.=====.=====.=======.=======.=====.=====.====.====.======.==============
 1 0 1 m -0.2900 .90    .40    232    91      0.900 0.400 232.0 91.00 245.200 245.200     0     0    0    0      0
 0 1 1 m -0.1200 .90    .40    143    22      1.300 0.600 136.9 20.97 137.500 190.552 44.44    50 -4.3 -4.7 38.583
 2 0 2 m -0.2900 1.00   .50    92     67      1.000 0.500    92    67 125.500 125.500     0     0    0    0      0
 1 1 2 m -0.2050 1.00   .50    96     14      1.400 0.700 89.66 13.08     103 134.680 40.00 40.00 -6.6 -6.6 30.757
 0 2 2 m -0.1200 1.00   .50.   12     1       1.800 0.900 11.20 0.934 12.5000 21.0006 80.00 80.00 -6.7 -6.6 60.005
 3 0 3 m -0.2900 1.00   .50    9      6       1.000 0.500     9     6      12      12     0     0    0    0      0
 2 1 3 m -0.2333 1.00   .50    28      7      1.400 0.700 25.90 6.476 31.5000 40.7932 40.00 40.00 -7.5 -7.5 29.502
 1 2 3 m -0.1767 1.00   .50    11      1      1.800 0.900 9.943 0.904 11.5000 18.7110 80.00 80.00 -9.6 -9.6 62.704
 4 0 4 m -0.2900 1.00   .50     1             1.000 0.500     1     0  .    1       1     0     0    0    0      0
 3 1 4 m -0.2475 1.00   .50     2             1.400 0.700 1.842     0       2 2.57880 40.00 40.00 -7.9    0 28.940
 2 2 4 m -0.2050 1.00   .50     8      2      1.800 0.900 7.115 1.779       9 14.4081 80.00 80.00 -11. -11. 60.090
.
*GRAND-TOTAL  -                ----   -----               ----  ----- ------- -----                   --------- ------
*                               634    211*               616.6 208.1 690.700 806.424                    -2.4   16.755
                       ..... END REPORT .....
```

5¢

```
.DATE 06 AUG 85  13:51:21  RID      42    06 AUG 85  HALL
.0850917 FARE STRUCTURES: mode                      BY: NKH               1001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.     REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.===================
 1 0 1 m -0.2900 .90 .  .40    232    91      1.000 0.450 225.0 87.95 245.200 264.578 11.11 12.50 -3.0 -3.4 7.9029
 0 1 1 m -0.1200 .90    .40    143    22      1.200 0.550 138.2 21.48 137.500 177.489 33.33 37.50 -3.4 -3.7 29.083
 2 0 2 m -0.2900 1.00   .50    92     67      1.100 0.550 89.49 65.18 125.500 134.288 10.00 10.00 -2.7 -2.7 7.0024
 1 1 2 m -0.2050 1.00   .50    96     14      1.300 0.650 91.00 13.27     103 126.926 30.00 30.00 -5.2 -5.2 23.229
 0 2 2 m -0.1200 1.00   .50    12     1       1.500 0.750 11.44 0.953 12.5000 17.8748    50    50 -4.7 -4.7 42.998
 3 0 3 m -0.2900 1.00   .50    9      6       1.100 0.550 8.755 5.837      12 12.8409 10.00 10.00 -2.7 -2.7 7.0075
 2 1 3 m -0.2333 1.00   .50    28     7       1.300 0.650 26.35 6.587 31.5000 38.5366 30.00 30.00 -5.9 -5.9 22.338
 1 2 3 m -0.1767 1.00   .50    11     1       1.500 0.750 10.25 0.932 11.5000 16.0740    50    50 -6.8 -6.8 39.774
 4 0 4 m -0.2900 1.00   .50     1             1.100 0.550 0.973     0       1 1.07030 10.00 10.00 -2.7    0 7.0300
 3 1 4 m -0.2475 1.00   .50     2             1.300 0.650 1:875     0       2 2.43750 30.00 30.00 -6.3    0 21.875
 2 2 4 m -0.2050 1.00   .50     8      2      1.500 0.750 7.370 1.843       9 12.4373    50    50 -7.9 -7.9 38.192
.
*GRAND-TOTAL  -
                                                          ----- ----- ------- -------             --------- ------
*                              634    211*                610.7 203.7 690.700 804.552                  -3.6  16.484
                     ..... END REPORT .....
```

6

```
.DATE 10 JUL 85  15:29:10  RID     48     10 JUL 85  HALL
.0850917 FARE STRUCTURES: two transfers                 BY: NKH                  1001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.         REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT..RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.   NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.======= =====.=====.=====.=====.=======.======= =====.===== ====.==== ====== ==================
 1 0 1   -0.2900 .90    .40    232    91   |0.900 0.400|232.0 91.00|245.200 245.200|    0     0|   0    0|     0
 0 1 1   -0.1200 .90    .40    143    22   |1.000 0.500|141.2 21.42|137.500 151.910|11.11 25.00|-1.3 -2.6|10.480
 2 0 2   -0.2900 1.00   .50    92     67   |1.000 0.500|   92    67|125.500 125.500|    0     0|   0    0|     0
 1 1 2   -0.2050 1.00   .50    96     14   |1.100 0.600|94.14 13.49|    103 111.648|10.00 20.00|-1.9 -3.6|8.3961
 0 2 2   -0.1200 1.00   .50    12      1   |1.100 0.600|11.86 0.978|12.5000 13.6328|10.00 20.00|-1.2 -2.2|9.0624
 3 0 3   -0.2900 1.00   .50    9       6   |1.000 0.500|    9     6|     12      12|    0     0|   0    0|     0
 2 1 3   -0.2333 1.00   .50    28      7   |1.100 0.600|27.39 6.709|31.5000 34.1544|10.00 20.00|-2.2 -4.2|8.4267
 1 2 3   -0.1767 1.00   .50    11      1   |1.100 0.600|10.82 0.968|11.5000 12.4828|10.00 20.00|-1.6 -3.2|8.5461
 4 0 4   -0.2900 1.00   .50    1           |1.000 0.500|    1     0|      1       1|    0     0|   0    0|     0
 3 1 4   -0.2475 1.00   .50    2           |1.100 0.600|1.953     0|      2 2.14830|10.00 20.00|-2.4    0|7.4150
 2 2 4   -0.2050 1.00   .50    8       2   |1.100 0.600|7,845 1.927|      9 9.7870|10.00 20.00|-1.9 -3.7|8.7300
*GRAND-TOTAL  -                  ----- -------        ----- ----- ------- -------             ---------  ------
*                                634*   211*          629.2 209.5 690.700*719.462                -0.7     4.164
                   ..... END REPORT .....
```

7

```
.DATE 10 JUL 85  15:14:34  RID     48     10 JUL 85  HALL
.0850917 FARE STRUCTURES: two transfers **            BY: NKH              I001160
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.       REVENUE      . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT., RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.   NEW    .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.================
 1 0 1    -0.2900 .90     .40    232    91      0.800 0.400 240.1 91.00 245.200 228.480 -11.1      0 3.49     0 -6.819
 0 1 1    -0.1200 .90     .40    143    22      1.000 0.500 141.2 21.42 137.500 151.910 11.11 25.00 -1.3  -2.6 10.480
 2 0 2    -0.2900 1.00    .50    92     67      1.000 0.500    92    67 125.500 125.500     0     0    0     0      0
 1 1 2    -0.2050 1.00    .50    96     14      1.200 0.600 92.49 13.49     103 119.082 20.00 20.00 -3.7  -3.6 15.614
 0 2 2    -0.1200 1.00    .50    12     1       1.200 0.600 11.74 0.978 12.5000 14.6748 20.00 20.00 -2.2  -2.2 17.398
 3 0 3    -0.2900 1.00    .50    9      6       1.000 0.500     9     6      12      12     0     0    0     0      0
 2 1 3    -0.2333 1.00    .50    28      7      1.200 0.600 26.84 6.709 31.5000 36.2334 20.00 20.00 -4.1  -4.2 15.027
 1 2 3    -0.1767 1.00    .50    11      1      1.200 0.600 10.65 0.968 11.5000 13.3608 20.00 20.00 -3.2  -3.2 16.181
 4 0 4    -0.2900 1.00    .50     1             1.000 0.500     1     0       1       1     0     0    0     0      0
 3 1 4    -0.2475 1.00    .50     2             1.200 0.600 1.912     0       2 2.29440 20.00 20.00 -4.4     0 14.720
 2 2 4    -0.2050 1.00    .50     8      2      1.200 0.600 7.707 1.927       9 10.4046 20.00 20.00 -3.7  -3.7 15.607
___________________________________________________________________________________________________________________
*GRAND-TOTAL                     ----- -------              ----- ----- ------- -------             --------- ------
*                                 634*    211*              634.6 209.5 690.700*714.940                  -0.1  3.509

                  ** four transfers are needed to accomodate both full and reduced fares **

                     ..... END REPORT .....
```

```
.DATE 11 JUL 85  09:11:56  RIO       45     11 JUL 85  HALL
.0850917 FARE STRUCTURES: Peak/Off-Peak & two transfer  C                                                              8
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.==================
 1 0 1 P -0.2068 0.90   0.400 138.7 54.4200 1.100 0.600 133.1 50.10 146.598 176.470 22.22    50 -4.0 -7.9 20.377
 0 1 1 P -0.0856 0.90   0.400 85.51 13.1600 1.200 0.700 83.44 12.56 82.2230 108.920 33.33    75 -2.4 -4.6 32.469
 2 0 2 P -0.2068 1.00   0.500 55.02 40.0700 1.200 0.700 52.99 37.40 75.0550 89.7680 20.00 40.00 -3.7 -6.7 19.603
 1 1 2 P -0.1462 1.00   0.500 57.41 8.37200 1.300 0.800 55.26 7.826 61.5960 78.0988 30.00 60.00 -3.7 -6.5 26.792
 0 2 2 P -0.0856 1.00   0.500 7.176 0.59800 1.300 0.800 7.018 0.575 7.47500 9.58340 30.00 60.00 -2.2 -3.8 28.206
 3 0 3 P -0.2068 1.00   0.500 5.382 3.58800 1.200 0.700 5.183 3.349 7.17600 8.56390 20.00 40.00 -3.7 -6.7 19.341
 2 1 3 P -0.1664 1.00   0.500 16.74 4.18600 1.300 0.800 16.03 3.876 18.8330 23.9398 30.00 60.00 -4.2 -7.4 27.116
 1 2 3 P -0.1260 1.00   0.500 6.578 0.59800 1.300 0.800 6.365 0.564 6.87700 8.72570 30.00 60.00 -3.2 -5.7 26.882
 4 0 4 P -0.2068 1.00   0.500 0.598       0 1.200 0.700 0.576     0 0.59800 0.69120 20.00 40.00 -3.7    0 15.585
 3 1 4 P -0.1765 1.00   0.500 1.196       0 1.300 0.800 1.142     0 1.19600 1.48460 30.00 60.00 -4.5    0 24.130
 2 2 4 P -0.1462 1.00   0.500 4.784 1.19600 1.300 0.800 4.605 1.118 5.38200 6.88090 30.00 60.00 -3.7 -6.5 27.850
 1 0 1 O -0.4137 .90    .40   93.26 36.5800 0.900 0.400 93.26 36.58 98.5660 98.5660     0     0    0    0      0
 0 1 1 O -0.1712 .90    .40   57.49 8.84400 1.000 0.500 56.46 8.514 55.2786 60.7170 11.11 25.00 -1.8 -3.7 9.8382
 2 0 2 O -0.4137 1.00   .50   36.98 26.9300 1.000 0.500 36.98 26.93 50.4450 50.4450     0     0    0    0      0
 1 1 2 O -0.2924 1.00   .50   38.59 5.62800 1.100 0.600 37.53 5.337 41.4040 44.4852 10.00 20.00 -2.7 -5.2 7.4418
 0 2 2 O -0.1712 1.00   .50   4.824 0.40200 1.100 0.600 4.746 0.390 5.02500 5.45460 10.00 20.00 -1.6 -3.0 8.5493
 3 0 3 O -0.4137 1.00   .50   3.618 2.41200 1.000 0.500 3.618 2.412 4.82400 4.82400     0     0    0    0      0
 2 1 3 O -0.3328 1.00   .50   11.26 2.81400 1.100 0.600 10.91 2.649 12.6670 13.5904 10.00 20.00 -3.1 -5.9 7.2898
 1 2 3 O -0.2521 1.00   .50   4.422 0.40200 1.100 0.600 4.317 0.384 4.42300 4.97910 10.00 20.00 -2.4 -4.5 7.7028
 4 0 4 O -0.4137 1.00   .50   0.402       0 1.000 0.500 0.402     0 0.40200 0.40200     0     0    0    0      0
 3 1 4 O -0.3531 1.00   .50   0.804       0 1.100 0.600 0.777     0 0.80400 0.85470 10.00 20.00 -3.4    0 6.3060
 2 2 4 O -0.2924 1.00   .50   3.216 0.80400 1.100 0.600 3.128 0.762 3.61800 3.89800 10.00 20.00 -2.7 -5.2 7.7391

*GRAND-TOTAL  -               ----- -------             ----- ----- ------- -----               --------- ------
*                             634.0 211.004             617.8 201.3 690.666 801.342                  -3.1 16.024
                        ..... END REPORT .....
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9

```
.DATE 11 JUL 85  09:31:13  RID     46     11 JUL 85  HALL
.@050917 FARE STRUCTURES: Peak/Off-Peak & two transfers **
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE    . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.= =======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.====== ==================
 1 0 1 P|-0.2068 0.90  0.400 138.7 54.4200|0.900 0.500|138.7 51.98|146.598 150.820|    0 25.00|   0 -4.5|2.8300|
 0 1 1 P|-0.0856 0.90  0.400 85.51 13.1600|1.100 0.600|84.06 12.72|82.2230 100.098|22.22    50|-1.7 -3.3|21.740|
 2 0 2 P|-0.2068 1.00  0.500 55.02 40.0700|1.100 0.600|53.95 38.59|75.0550 82.4990|10.00 20.00|-1.9 -3.7|9.9181|
 1 1 2 P|-0.1462 1.00  0.500 57.41 8.37200|1.300 0.700|55.26 7.974|61.5960 77.4198|30.00 40.00|-3.7 -4.8|25.690|
 0 2 2 P|-0.0356 1.00  0.500 7.176 0.59800|1.300 0.700|7.018 0.581|7.47500 9.53010|30.00 40.00|-2.2 -2.8|27.493|
 3 0 3 P|-0.2068 1.00  0.500 5.382 3.58800|1.100 0.600|5.277 3.456|7.17600 7.87830|10.00 20.00|-2.0 -3.7|9.7868|
 2 1 3 P|-0.1664 1.00  0.500 16.74 4.18600|1.300 0.700|16.03 3.960|18.8330 23.6110|30.00 40.00|-4.2 -5.4|25.370|
 1 2 3 P|-0.1260 1.00  0.500 6.578 0.59800|1.300 0.700|6.365 0.573|6.87700 8.67560|30.00 40.00|-3.2 -4.2|26.154|
 4 0 4 P|-0.2068 1.00  0.500 0.598       0|1.100 0.600|0.586     0|0.59800 0.64460|10.00 20.00|-2.0    0|7.7926|
 3 1 4 P|-0.1765 1.00  0.500 1.196       0|1.300 0.700|1.142     0|1.19600 1.48460|30.00 40.00|-4.5    0|24.130|
 2 2 4 P|-0.1462 1.00  0.500 4.784 1.19600|1.300 0.700|4.605 1.139|5.38200 6.78380|30.00 40.00|-3.7 -4.8|26.046|
 1 0 1 O|-0.4137 .90   .40   93.26 36.5800|0.800 0.400|97.91 36.58|98.5660 92.9600|-11.1     0|4.99    0|-5.688|
 0 1 1 O|-0.1712 .90   .40   57.49 8.84400|1.000 0.500|56.46 8.514|55.2786 60.7170|11.11 25.00|-1.8 -3.7|9.8382|
 2 0 2 O|-0.4137 1.00  .50   36.98 26.9300|1.000 0.500|36.98 26.93|50.4450 50.4450|    0     0|   0    0|     0|
 1 1 2 O|-0.2924 1.00  .50   38.59 5.62800|1.200 0.600|36.59 5.337|41.4040 47.1102|20.00 20.00|-5.2 -5.2|13.782|
 0 2 2 O|-0.1712 1.00  .50   4.824 0.40200|1.200 0.600|4.676 0.390|5.02500 5.84520|20.00 20.00|-3.1 -3.0|16.322|
 3 0 3 O|-0.4137 1.00  .50   3.618 2.41200|1.000 0.500|3.618 2.412|4.82400 4.82400|    0     0|   0    0|     0|
 2 1 3 O|-0.3328 1.00  .50   11.26 2.81400|1.200 0.600|10.60 2.649|12.6670 14.3094|20.00 20.00|-5.9 -5.9|12.966|
 1 2 3 O|-0.2521 1.00  .50   4.422 0.40200|1.200 0.600|4.224 0.384|4.62300 5.29920|20.00 20.00|-4.5 -4.5|14.627|
 4 0 4 O|-0.4137 1.00  .50   0.402       0|1.000 0.500|0.402     0|0.40200 0.40200|    0     0|   0    0|     0|
 3 1 4 O|-0.3531 1.00  .50   0.804       0|1.200 0.600|0.754     0|0.80400 0.90480|20.00 20.00|-6.2    0|12.537|
 2 2 4 O|-0.2924 1.00  .50   3.216 0.80400|1.200 0.600|3.050 0.762|3.61800 4.11720|20.00 20.00|-5.2 -5.2|13.798|
*GRAND-TOTAL  -              ----- -------             ----- ----- ------- -------             --------- ------
*                            634.0 211.004             628.3 204.9 690.666 756.379                  -1.4  9.514

                  **  four transfers are needed to accommodate both full and reduced fares **

                .....  END REPORT .....
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10a

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.DATE 06 AUG 85  16:40:29  RID     45    06 AUG 85  HALL
.0850917 FARE STRUCTURES: Peak/Off-Peak & two transfer
*SERVICE.ELAST- .INIT. #FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE    . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW  .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.============
 1 0 1 P -0.2068 0.90  0.400 138.7 54.4200 0.900 0.400 138.7 54.42 146.598 146.598     0     0    0    0      0
 0 1 1 P -0.0856 0.90  0.400 85.51 13.4600 1.000 0.450 84.74 13.03 82.2230 90.6035 11.41 12.50 -0.9 -1.0 10.192
 2 0 2 P -0.2068 1.00  0.500 55.02 40.0700 1.000 0.500 55.02 40.07 75.0550 75.0550     0     0    0    0      0
 1 1 2 P -0.1462 1.00  0.500 57.41 8.37200 1.100 0.550 56.62 8.256 61.5960 66.8228 10.00 10.00 -1.4 -1.4 8.4856
 0 2 2 P -0.0856 1.00  0.500 7.176 0.59800 1.200 0.600 7.065 0.589 7.47500 8.83140 20.00 20.00 -1.5 -1.5 18.146
 3 0 3 P -0.2068 1.00  0.500 5.382 3.58800 1.000 0.500 5.382 3.588 7.47600 7.47600     0     0    0    0      0
 2 1 3 P -0.1664 1.00  0.500 16.74 4.10600 1.100 0.550 16.48 4.120 18.8330 20.3940 10.00 10.00 -1.6 -1.6 8.2886
 1 2 3 P -0.1260 1.00  0.500 6.578 0.59800 1.200 0.600 6.429 0.584 6.87700 8.06520 20.00 20.00 -2.3 -2.3 17.278
 4 0 4 P -0.2068 1.00  0.500 0.598       0 1.000 0.500 0.598     0 0.59800 0.59800     0     0    0    0      0
 3 1 4 P -0.1765 1.00  0.500 1.196       0 1.100 0.550 1.176     0 1.19600 1.29360 10.00 10.00 -1.7    0 8.1605
 2 2 4 P -0.1462 1.00  0.500 4.784 1.19600 1.200 0.600 4.659 1.165 5.38200 6.28980 20.00 20.00 -2.6 -2.6 16.867
 1 0 1 O -0.4137 .90   .40   93.26 36.5800 0.800 0.350 97.91 38.66 98.5660 91.8590 -11.1 -12.5 4.99 5.69 -6.805
 0 1 1 O -0.1712 .90   .40   57.49 8.84400 0.800 0.350 58.66 9.048 55.2786 50.0948 -11.1 -12.5 2.04 2.31 -9.378
 2 0 2 O -0.4437 1.00  .50   36.98 26.9300 0.900 0.450 38.63 28.13 50.4450 47.4255 -10.0 -10.0 4.46 4.46 -5.986
 1 1 2 O -0.2924 1.00  .50   38.59 5.62800 0.900 0.450 39.80 5.804 41.4040 38.4318 -10.0 -10.0 3.14 3.13 -7.179
 0 2 2 O -0.1712 1.00  .50   4.824 0.40200 0.900 0.450 4.942 0.409 5.02500 4.60485 -10.0 -10.0 1.82 1.74 -8.364
 3 0 3 O -0.4437 1.00  .50   3.648 2.41200 0.900 0.450 3.779 2.549 4.82400 4.53465 -10.0 -10.0 4.45 4.44 -5.998
 2 1 3 O -0.3328 1.00  .50   11.26 2.81400 0.900 0.450 11.66 2.944 12.6670 11.8053 -10.0 -10.0 3.55 3.55 -6.803
 1 2 3 O -0.2521 1.00  .50   4.422 0.40200 0.900 0.450 4.541 0.413 4.62300 4.27275 -10.0 -10.0 2.69 2.74 -7.576
 4 0 4 O -0.4137 1.00  .50   0.402       0 0.900 0.450 0.420     0 0.40200 0.37800 -10.0 -10.0 4.48    0 -5.970
 3 1 4 O -0.3531 1.00  .50   0.804       0 0.900 0.450 0.834     0 0.80400 0.75060 -10.0 -10.0 3.73    0 -6.612
 2 2 4 O -0.2924 1.00  .50   3.216 0.80400 0.900 0.450 3.347 0.829 3.61800 3.35835 -10.0 -10.0 3.14 3.44 -7.477
.
*GRAND-TOTAL  -              ----- -------             ----- ----- ------- -------             --------- ------
*                            634.0 211.004             641.3 214.6 690.666 689.243                   1.3 -0.206
                   ..... END REPORT .....
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106

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.DATE 06 AUG 85  14:43:19. RID     45    06 AUG 85  HALL
.@850917 FARE STRUCTURES: Peak/Off-Peak & two transfer
*SERVICE.ELAST- .INIT. FARES.INITIAL VOL.S.NEW FARES  .NEW VOLUMES.    REVENUE     . P E R   C E N T   C H A N G E S :
*B.R.T.X.ICITIES.ADULT. RED..ADULT.REDUCED.ADULT. RED..ADULT. RED..INITIAL.  NEW   .AFARE.BFARE.AVOL.BVOL.TOTREV.
*=.=.=.=.=======.=====.=====.=====.=======.=====.=====.=====.=====.=======.=======.=====.=====.====.====.======.=====================
 1 0 1 P -0.2068 0.90  0.400 138.7 54.4200 1.000 0.450 135.7 53.11 146.598 159.600 11.11 12.50 -2.2 -2.4 8.8692
 0 1 1 P -0.0856 0.90  0.400 85.51 13.1600 1.300 0.600 82.89 12.72 82.2230 115.389 44.44    50 -3.1 -3.3 40.337
 2 0 2 P -0.2068 1.00  0.500 55.02 40.0700 1.100 0.550 53.95 39.29 75.0550 80.9545 10.00 10.00 -1.9 -1.9 7.8602
 1 1 2 P -0.1462 1.00  0.500 57.41 8.37200 1.400 0.700 54.68 7.974 61.5960 82.1338 40.00 40.00 -4.8 -4.8 33.343
 0 2 2 P -0.0856 1.00  0.500 7.176 0.59800 1.700 0.850 6.864 0.572 7.47500 12.1550 70.00 70.00 -4.3 -4.3 62.609
 3 0 3 P -0.2068 1.00  0.500 5.382 3.58800 1.100 0.550 5.277 3.518 7.17600 7.73960 10.00 10.00 -2.0 -2.0 7.8540
 2 1 3 P -0.1664 1.00  0.500 16.74 4.18600 1.400 0.700 15.84 3.960 18.8330 24.9480 40.00 40.00 -5.4 -5.4 32.470
 1 2 3 P -0.1260 1.00  0.500 6.578 0.59800 1.700 0.850 6.162 0.560 6.87700 10.9514 70.00 70.00 -6.3 -6.4 59.247
 4 0 4 P -0.2068 1.00  0.500 0.598       0 1.100 0.550 0.586     0 0.59800 0.64460 10.00 10.00 -2.0    0 7.7926
 3 1 4 P -0.1765 1.00  0.500 1.196       0 1.400 0.700 1.128     0 1.19600 1.57920 40.00 40.00 -5.7    0 32.040
 2 2 4 P -0.1462 1.00  0.500 4.784 1.19600 1.700 0.850 4.435 1.109 5.38200 8.48245 70.00 70.00 -7.3 -7.3 57.602
 1 0 1 O -0.4137 .90   .40   93.26 36.5800 0.800 0.350 97.91 38.66 98.5660 91.8590 -11.1 -12.5 4.99 5.69 -6.805
 0 1 1 O -0.1712 .90   .40   57.49 8.84400 0.800 0.350 58.66 9.048 55.2786 50.0948 -11.1 -12.5 2.04 2.31 -9.378
 2 0 2 O -0.4137 1.00  .50   36.98 26.9300 0.900 0.450 38.63 28.13 50.4450 47.4255 -10.0 -10.0 4.46 4.46 -5.986
 1 1 2 O -0.2924 1.00  .50   39.59 5.62800 0.900 0.450 39.80 5.804 41.4040 38.4318 -10.0 -10.0 3.14 3.13 -7.179
 0 2 2 O -0.1712 1.00  .50   4.824 0.40200 0.900 0.450 4.912 0.409 5.02500 4.60485 -10.0 -10.0 1.82 1.74 -8.361
 3 0 3 O -0.4137 1.00  .50   3.648 2.41200 0.900 0.450 3.779 2.519 4.82400 4.53465 -10.0 -10.0 4.45 4.44 -5.998
 2 1 3 O -0.3328 1.00  .50   11.26 2.81400 0.900 0.450 11.66 2.914 12.6670 11.8053 -10.0 -10.0 3.55 3.55 -6.803
 1 2 3 O -0.2521 1.00  .50   4.422 0.40200 0.900 0.450 4.541 0.413 4.62300 4.27275 -10.0 -10.0 2.69 2.74 -7.576
 4 0 4 O -0.4137 1.00  .50   0.402       0 0.900 0.450 0.420     0 0.40200 0.37800 -10.0 -10.0 4.48    0 -5.970
 3 1 4 O -0.3531 1.00  .50   0.804       0 0.900 0.450 0.834     0 0.80400 0.75060 -10.0 -10.0 3.73    0 -6.642
 2 2 4 O -0.2924 1.00  .50   3.246 0.80400 0.900 0.450 3.317 0.829 3.61800 3.35835 -10.0 -10.0 3.14 3.11 -7.477
.
*GRAND-TOTAL  -              ----- -------             ----- ----- ------- -------             ---------- ------
*                            634.0 211.004             632.0 211.5 690.666 762.093                   -0.2 10.342
                      ..... END REPORT .....
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8/4/2008
WT 140786 1 78 00

HF GROUP